Australia 2050

Living Scenarios

"Structuring Conversations" October 2013, Workshop Report

Contents

About this document

Nature and purpose

This report is a record, for participants, of the conversations that were had and the ideas that emerged at the Australia 2050 Living Scenarios workshop, held at the Australian Academy of Science in November 2013. This material is now provided as a resource for those who want to build on this workshop with their own conversations.

Level of summary and synthesis

For this document, members of the organising committee have applied only a minimal level of summary and synthesis. We have tried to preserve the diversity of views, which was one of our stated objectives for this workshop. We have offered a brief summary of each archetype. These appear at the end of each archetype section and are gathered together in the Executive Summary. As event organisers, we have not sought to provide any of our own reflections or interpretation at this stage. Rather, this document aims to reflect a summary of participants' responses.

Reasons for the approach taken to this workshop

We reiterate that this was not intended to be an expert workshop nor a formal scenario planning exercise. It was designed to share the different thinking participants brought to the four archetype futures, without subjecting views to critical scrutiny by specialist experts. Our hypothesis, based in a lot of evidence, was that we are in a much better position to have productive and informed dialogue about the future if we first recognise and understand the assumptions that we each bring to the dialogue and the assumptions and views that others bring. This step is often missing in discussions about the future. Unwanted outcomes in this case include groups of people reaching consensus because they accept dominant views uncritically, or discussions breaking down as groups fail to deal productively with divergent views.

Structure of the document

The document consists of an executive summary and four major sections that focus separately on each of the archetype futures: growth, restraint, catastrophe and transformation. There are also sections summarising participants' comments on key messages and on the process itself.

Each archetype section starts with a brief overall impression and an overview, which is a table of contents for the rest of the section. The main headings within each archetype are the three topics participants were asked to address:

- what the archetype means to them
- what that type of future might look like in 2050
- what the pathways to that future might be like.

The subheadings are a summary of each of the main groups of ideas we have discerned by grouping the comments typed into iMEET! At the end of each archetype there is a summary of what we interpreted as the main themes.

The four archetypes are colour-coded (the headings are in different colours and there is a coloured strip down the left of the page) for ease of identification.

Executive summary

This executive summary repeats the four summaries that appear at the end of each of the major sections on the archetypes futures.

Archetype: Growth

When comparing with other archetypes, participants described the most difficulties with conversations about growth futures. While there were acknowledgments that 'growth has been overwhelmingly good', there was far greater emphasis on the downsides of growth and participants wanted to identify growth futures that emphasised benefits with minimal unwanted impacts.

There was a strong emphasis on definitions and measures of growth that include more than material or economic dimensions. Participants spoke of growth in energy and resource efficiency, growth in the quality of non-material aspects of life, growth in equity and opportunities for all rather than a privileged minority, and a growth in long-term focus rather that maximising short-term benefits.

Connectivity was identified as a key feature of growth futures, bringing the world closer together through more diverse ways of connecting with each other, but also bringing more social isolation and weaker local connections due to a greater focus on virtual connections.

Technological change was assumed to underpin growth futures, with technology playing a particularly large role in enabling connectivity, new and more efficient ways of accessing and using resources, improving the quality and length of life and helping us see the world in new ways (e.g. new ways of monitoring, surveillance, measurement and making use of big data).

Finally, ethical dilemmas and questions of responsibility were far more apparent in this archetype than others.

Archetype: Restraint

In conversations about the future, how a concept like 'restraint' is framed is very important. Many of the discussions were about language and our interpretation of what is meant by 'restraint'. If the restraint is due to top-down imposition of strict moral judgments then it is highly undesirable and to be avoided. On the other hand, if restraint is a collective choice to

maintain and protect ecosystems, health, cultures and opportunities for the long-term benefit of all then that is a far more desirable future, and many were able to provide very detailed descriptions of the benefits. Hence there was a lot of emphasis on how to frame restraint futures in win-win way, and most of the descriptions of what restraint futures would look like dwelt on these desirable outcomes.

When it came to discussing the specific mechanisms for restraint at a societal level, most focus was on strong government regulations and restrictions. There were some references to market instruments and ways of ensuring prices better reflect unwanted impacts of material consumption. Other emerging mechanisms such as ecosystem stewardship and accounting frameworks as well as collaborative consumption platforms were also discussed.

In general participants expressed doubt that we can find way to overcome aspects of human nature that work against collective restraint, referring often to the current dominance of values such as immediate individual convenience and pleasure, rather than long-term benefit to all. Our social norms and political and planning cycles were seen to be reinforcing these short-term individual wants and rendering long-term impacts invisible. It's not that costs of restraint outweigh benefits, but rather the mismatch in scales (me/here versus everyone/later) gives the short-term costs disproportionate influence.

For these reasons participants pointed to ways of making unwanted impacts and costs more visible to all via better information gathering, availability and communication. Some suggested this information would be to create social exposure and trigger shifts in cultural norms, and others pointed to this information being a key part of more formal or binding structures such as national ecosystem accounts and accreditation requirements.

Finally, restraint in itself was seen by many as a useful capacity or skill to develop, and not something to be minimised. It may seem counter-intuitive, but having the option to exercise restraint actually increases, not diminishes, our options and provides a useful contribution to our adaptive capacity and resilience. Furthermore, embedding resource constraints as goals in planning and design triggers the innovation and imagination required to find new ways of living within our means. Anticipating the benefits of restraint and finding ways of fostering chosen, collective restraint was seen to be a less likely, but more desirable pathway than having restraint left as our only option, imposed by catastrophic necessity.

Archetype: Catastrophe

A distinct feature of descriptions of catastrophe futures is the recognition that there are many ways in which catastrophe leads to unwanted outcomes that themselves increase the likelihood of ongoing catastrophe and collapse: an amplifying feedback loop that is difficult to stop once set in train. Another prominent feature of catastrophe futures is the loss of some less visible, vital attributes of society that build adaptive capacity and resilience to shocks. These included systems for learning, redundancy and buffers that may not be economically

efficient in the short term but provide options and room to move in tough times. The quality of our response was seen as critical. Catastrophic events can bring out the best in humanity, and in this way can seed transformation for good. Participants were asked to reserve those discussions for the Transformation archetype. Conversations on catastrophe futures emphasised the opposite effect, where catastrophic events bring out the worst in humanity: selfishness, anger, violence and lack of respect or consideration for others.

While various shocks and emergencies, such as natural disasters, pandemics and violent attack, were given as potential pathways to catastrophe, considerably more descriptions were about pathways of eroding infrastructure that leave society more vulnerable to such shocks and emergencies. Here 'infrastructure' refers to built infrastructure, human and social capital (including adaptive capacity) and natural ecosystems.

Archetype: Transformation

Workshop participants reported that this archetype challenged them to think about what they value in the present Australia, what they would hate to lose, what they would like to gain in the future, and what factors might drive desirable or undesirable transformations (fundamental changes) in Australia in the future.

Although most participants focused on desired and beneficial transformations (encouraged by the workshop organisers, because negative transformations were addressed in other archetypes), undesirable transformations occasionally came to the surface.

Desired transformations tended to be about a fairer and more cooperative society, but, in common with the conversations about restraint scenarios, there was a sense that such transformations will require numerous changes to attitudes and social processes (especially governance structures and the nature of politics and leadership) that currently seem unlikely. It was also recognised that there is a need for conversations about what a 'desired future' means to Australians. It was clear that there is no one vision that we all share, but there are probably core elements that are part of most visions.

Perhaps the most challenging aspect of the conversations in this archetype was that so many aspects of a desired future were seen as requiring fundamental change from present Australia.

Archetype: Growth

Brief overall impression

Globalisation, social stability, energy supply and other biophysical resources were identified as requirements for growth futures, and global imbalances, inequities, unsustainable resource use, environmental degradation and the complexity of interactions were named as potential sources of instability or risk in these futures.

Overview of growth futures

What does a growth archetype mean to you?

Some experienced difficulties when discussing growth futures

Participants made comments about the difficulties they experienced when talking about the growth scenario (and more so than in other archetypes). They found it difficult to imagine where growth in one aspect of life doesn't entail reduction elsewhere, or other complex interactions. Many considered it unrealistic to imagine unrestricted growth, and many had strong negative views on growth futures. There were also difficulties in identifying cause and effect. Pathways other than 'business as usual' were hard to identify, and 'business as usual' was seen to be problematic or unviable.

Discussions covered material and non-material growth

Participants said that how we envisage growth futures depends on how we define and measure growth. There was a preference for including many dimensions, such as social, ethical, intellectual and emotional aspects, as well as material and economic measures.

Growth was envisaged as growth in resource use, population, connectivity, efficiency and prosperity. Examples of aspects of life that participants mentioned include growth in:

- resource use and growth in speed, and magnitude of production and consumption
- waste and pollution
- existing cities (including cities such as Wollongong, Sydney, Newcastle being linked up)
- development of new cities
- noise
- information technology
- transport options and mobility
- efficiency of use of natural resources
- connectivity, global communities
- knowledge, complexity of thinking
- social cohesion
- subcultures, languages, diverse micro-communities (potentially with growth in segregation and more tribal behaviour)

- the number of ways of dealing with problems (e.g. more innovation, new technologies, more options for responding to challenges or problems)
- convenience
- advertising
- cognitive capacity
- identity
- quality of life or prosperity: each generation better off than the one before
- flexibility
- creativity (e.g. new art, music)
- happiness and culture.

Many negative aspects of material growth

Participants wondered if growth is 'always a good thing'? There was little emphasis on the benefits of material growth but instead a strong emphasis on unwanted consequences of growth. Many participants expressed the view that material growth comes at a cost of social inequality, degradation of the environment, human health and wellbeing. There was also concern about the conflict between sustainable and unsustainable growth. In general, the view that there is a disconnection between happiness or wellbeing and material or economic growth came through strongly. However, there was a focus on benefits of non-material aspects of growth ('fundamentally good things') rather than material aspects of growth ('consuming finite resources to build and buy more crap'). This discussion raised the question of how to define and measure growth in happiness.

Growth can't continue

Participants said that growth can't be unlimited, and exponential growth in particular can't be sustained. They referred to growth in efficiency of resource use (through technology and behaviour change), and pointed to increased recycling and closed loop production cycles to allow growth within a limited material base. There were also references to off-planet expansion, such as mining asteroids, and there were differing views on the plausibility of such options. These thoughts prompted some to focus more on growth of non-material aspects of life.

Our current aspirations are predicated on growth

Participants spoke of how commonly assumed goals in life and markers of success (e.g. house size, car ownership) are predicated on growth, and some also referred to growing discomfort and questioning of the wisdom of such aspirations.

What might a growth future look and feel like?

Global connectivity brings positive and negative changes and opportunities

Global connectivity and globalisation were given as prominent features of growth futures, creating growing opportunities for trade and new markets, as well as greater vulnerability via higher level of exposure to global events (e.g. global financial crises, security threats and conflicts). We could find ourselves getting drawn into events far away, or affected by far-distant events in unexpected ways (e.g. Kenyan farmers destroyed crops and laid off workers when volcanic eruptions in Iceland temporarily closed access to European markets). Greater foreign ownership of Australian real estate was anticipated (e.g. 'every Chinese millionaire will own a second home / beach house / bush retreat in Australia').

Societal structures will be very different

Participants anticipated two kinds of changes in societal structures: societal organisation, such as age structure, family and social relationships; and social norms and technologies, such as markets, money, laws and institutions.

There were open questions on whether there would be a growth in quality of life. Comments were divided between expecting an Australia in 2050 that was kinder, more equal and more inclusive; or one that was the opposite, with growth creating growing disparities in communities (or genders or other groupings) and less trust between people. There was the suggestion that there could be increased concentration of power and influence, strengthening the influence of multinationals or curtailing options for civil disobedience.

Changing families: ageing population and greater participation of men in parenting

The ageing population was seen as both a burden on society (caring for the elderly), and a way to manage pressures of working families (grandparents caring for grandchildren). The return of the extended family was mentioned, as well as greater inclusion and participation (e.g. men taking a greater role in parenting and aged care, more diverse family structures and shared parenting/caring arrangements, and work places better supporting families). There was a suggestion of an expanding two-income 'sandwich generation' (a generation caring for ageing parents while raising their own children). There were questions about appropriate policies to address issues with ageing, anticipating a lower tax base to support an older population, and more social diversity in those requiring aged care. There was also a suggestion that assisted death, or euthanasia, may be more acceptable.

Growth in technology and information processing, and growing dependence on technology

Participants expected to see much more growth in information technology (IT), and a growth in the different ways it is used in our lives. Examples included more: personalisation; forms of eye, speech or fingerprint recognition; efficient and diverse forms of production and services; ways of connecting with one another; ways of operating remotely from one another; advances that simplify tasks or activities; monitoring and surveillance; sophisticated forms of coordination; and governance or regulation. Participants referred to interactions between technological and social change, pointing out that technological change often enables social change, but then society becomes dependent on that technology. There were suggestions that dependence on networks, cashless economic exchanges or particular technologies create new vulnerabilities due to that dependency. An anticipated vulnerability was that technological growth could outpace legal and political systems' ability to catch up.

Growth in information, knowledge and surveillance

Participants expected growth in information, knowledge, artificial and networked intelligence, and gathering and use of big data. With an abundance of information, some suggested that key capabilities will be in analysis, interpretation and use of data rather than in acquiring it. Participants anticipated greater surveillance and monitoring of people's activities.

Growth in social connectivity

Internet connectivity was seen as allowing greater social connection and inclusion by many, as well as being a liberating technology for workers. It was seen as potentially helpful in enabling global communities, shared vision and sense of identity, more appreciation of others' views and experiences, and resolution of conflicts of power and wealth inequalities.

There were mixed views on whether greater connectivity fosters greater diversity (e.g. more ways of thinking, living and deciding for oneself) or more uniformity, and whether people would be more accepting of differences or more intolerant. There was the suggestion that a specific commitment to diversity will be required if we are to maintain high levels of diversity or to retain traditional practices and ways of living.

Loss of privacy was identified as a potential downside of higher connectivity and means for surveillance, with privacy a 'historical blip' experienced only briefly by humanity. International connectivity, while allowing growth through trade, was seen as a problem as it meant that Australia could not insulate itself from geopolitical problems and forces elsewhere in the world.

Participants also identified opportunities for new social groupings, identities and virtual homes. There were suggestions that people will increasingly choose virtual connections over physical (e.g. 'Gadgets are isolating people. Sitting in the café texting.'). There was the suggestion that these interactions are shorter and shallower than meaningful face-to-face interactions, and that there could be a reaction against superficial connections.

Changes in education: overwhelming amount and diversity of information

Some participants anticipated the amount and diversity of information available and required to inform our work and life will exceed what can be handled in a standard university course. There were also open questions about the equity of access to and participation in education.

Change in media: end of current media power arrangements, more decentralised media or more power concentrated in specific interests

Participants suggested growth futures could see the end of dominance of media monopolies, with more decentralised media enabling citizen journalism and better public discourse. There were other suggestions that there could be increased concentration of power in multinationals that could see the reverse effect: a greater concentration of power serving specific interests.

Democratisation of production, more diverse work and workplaces

There were general references to growth providing more employment. Participants spoke of greater democratisation of production (e.g. 3D printing), more diverse employment opportunities (e.g. more small to medium enterprises, and more green jobs), and more diverse workplace arrangements (e.g. working from home, working in global networks, or other decentralised structures). Particular sectors or industries mentioned included tourism, recycling, renewable energy, biological systems, urban design, industrial ecology (e.g. building closed loop production systems), communication (e.g. citizen journalism), services (further away from manufacturing), and environmental activities to support sustainable intensification.

Technological advances are anticipated to reduce the need for human input in some kinds of production, with growing automation and reduction of manual tasks. There were questions raised about how those in decentralised and individualised work arrangements can create employment for others. Globalisation may provide good employment opportunities for those with high-level marketable skills, but decrease opportunities for those without such skills.

Change in economy: alternative currencies of exchange, more sharing and collective access or more economic inequities

Fundamental changes in the way society operates were anticipated by some, such as moves away from money to alternative currencies and forms of economic exchange, better pricing of intangibles, more fractional ownership, sharing and collective access rather than individual ownership. With new forms of production and ways of exchanging, there were also questions asked about the potential for growing economic disparities and more people being left behind as a result of others' growth. There is the potential for increased specialisation in professions, which was viewed as both an economic strength and vulnerability (e.g. could foster more myopic views and provide less opportunities for generalist 'Jack of all trades' skills).

Changes in health: longer lives, more mental health issues

With big changes in society, participants anticipated growing stress and depression, and difficulties in navigating the growing role of technology in our lives. There was also a suggestion that we would be maintaining more identities and roles (e.g. professionally and culturally) and this could create a set of stresses and mental health issues.

Changes in lifestyle: richer, more flexible, more human-focused activities, or more rules and restrictions on personal freedoms

Some participants spoke of the potential for richer, more flexible lives and more opportunities for leisure. Others spoke of growing pressures from growth in population and density of people leading to busier lives, more rules, more restrictions and fewer personal freedoms.

With a growth in artificial intelligence, there was the suggestion it would trigger a shift in how people spend their time, choosing activities that are more uniquely human. Examples given included creative arts and cultural activities, creating new sub-cultures, new music and new artistic endeavours.

Changes in democracy: technology enables more participation

Growth in technological complexity, and growing access to technology, were anticipated as powerful forces in democracy, with a growth in online political engagement and grassroots democracy. The diversity in governance systems may increase and there were some questions about the access to such systems from the haves versus have-nots.

Cities change in response to growth

Participants anticipated larger cities and, from that, greater imperative to handle transport, waste, food, energy, and material demands of urban populations. Most comments identified anticipated challenges of growth futures for cities and regional areas, but one comment

described 'a chain of pearls of beautiful coastal cities connected by high speed rail, … a strong local governance structure, … a restored Murray Darling Basin, … regional cities have high class universities and infrastructures'.

Growth in traffic, transport options or growth in fragmentation

Participants referred to more diverse options for personal mobility, and more use of direct flights for ease and convenience. Greater mobility could see more cultural mixing, but there were suggestions that growing city size can also fuel fragmentation due to prohibitively long travel times (e.g. due to more traffic congestion and larger travel distances).

Growth in crime and other social problems

Some suggested there could be a growth in crime and criminal acts, enabled by growing creativity and opportunities for crime and perhaps driven by wealth inequality and other social problems (e.g. drug use, social isolation, health issues). Participants spoke of a world with growing terrorism, insecurity, weapons of mass destruction and transnational security threats.

Identity may shift away from nationhood

There was a suggestion that people may identify with their career, their family, or online groupings more than the nation. In some conversations, there were references to increased cultural diversity and cultural silos, and in others there were references to increased connectivity leading to greater assimilation and uniformity.

Physical impacts of growth may hit environmental limits by 2050

Global limits to growth might be hit by 2050. Participants said this could impact on Australia through collapse of markets or increased numbers of refugees seeking to enter the country. Physical changes to Australia figured large, with descriptions of human-dominated systems and intensely used environment: 'growth has overshot our resource base and we are now eating into our capital'. These were driven by responses to a much-increased population leading to bigger cities or decentralised development. Some participants anticipated being able to use wealth growth to fix environmental problems, while others saw ongoing environmental degradation (e.g. increased land degradation from growing demands on agricultural production).

Changes to oceans were anticipated, including a growth in energy and resource extraction from oceans (e.g. tidal energy, deep sea drilling, gas hydrates, geothermal vents, alluvial diamonds, gold, food supply via aquaculture), increase in coastal degradation, ocean acidification, and pressures on fisheries. Participants also pointed to increased governance challenges associated with these changes.

Food demands place pressure on agricultural and ocean systems

There were several references to food. Some spoke of pressure on Australia's agricultural systems to meet growing local and global food demand. Participants suggested potential consequences of producing more food more efficiently, including reduced quality, more convenience or fast food (and associated health impacts), expansion of aquaculture, increased pressure on ecosystems (particularly agricultural, coastal and ocean systems), increased ability to grow food in places where it is currently unviable, factory-grown meat, and less diversity in food. There were differing views on whether there would be increased or decreased emphasis on local food production (e.g. urban food systems).

How might growth futures come about (i.e. by which possible pathways)?

'Business as usual' the most commonly suggested pathway

'Business as usual' was the most commonly identified growth pathway. Key components to this included structures for operating businesses, governing our population, and running the economy. The emergence of the advertising industry was given as a significant driver of growth in the past ('newly realised capacity to make consumers consume, consume, consume'). Participants asked whose interests are being served in pursuing growth: is it business interests seeking larger markets? This archetype was seen as the place of 'unfettered market freedom', and the entrepreneurial view that growth can't and shouldn't be restrained. There were questions about whether businesses can shift to focus on long-term sustainable growth versus short-term measures of growth, and whether definitions of growth can be more inclusive of other dimensions.

Globalisation drives growth futures

Globalisation was seen as either a necessity or inevitability in growth futures. While there were many references to the potential for more diversity, and stronger emphasis on local matters, it was usually discussed within a context of ongoing globalisation.

Population expansion drives growth futures

Many saw the growth in population as a key driver. Given a rate of immigration, the age structure changes in the population were seen as inexorable, and so a driver of societal structural changes to come. Population growth in Australia was described as a political choice rather than a natural phenomenon. Participants also pointed to the impact of medical technologies on population, extending life, reducing mortality rates and lowering birth rates.

Technological change drives growth futures

The changes in material technology that were seen as drivers included use of renewables, recycling, and exploitation of new sources of minerals and food. Changes in social technology were also thought important for enabling greater social connectivity, appreciation of non-material consumption, and changes in the social technologies underpinning markets and trade. Technology can provide greater transparency mechanisms for purchasing and consuming, as well as more personal surveillance. There were also anticipated ongoing improvements in medical and other technologies to extend people's lives and improve quality of life.

Technology was seen to be a source of new markets and employment opportunities, and the provider of alternative energy sources necessary to fuel growth. Some suggested that growth futures will be characterised by a faith that technology will resolve problems as they arise, although there was also a cautionary comment that 'single fixes may not be well-suited in the long term to complex, co-evolved systems'.

The connectivity enabled by technology was mentioned frequently. Local innovations have the opportunity to benefit all thanks to connectivity. The anticipated dependence on technology was expected to drive its own social changes too, including possibilities of more/less fragmentation, social isolation, changes in identity, and new vulnerabilities due to technological dependence.

Social drivers of growth: consumerism, creativity, values, short-term or long-term goals, the stories we tell

There were many references to a culture of consumerism (e.g.'consumerism is a dominating paradigm.') Growth has enabled conspicuous consumption, which in turn drives the expectation of more conspicuous consumption. Cultural values other than consumerism, were identified and these included: creativity, pluralism, multiculturalism, sustainability, ethical investment and pro-social values. These were seen as important, especially if business and market incentive structures change to reflect these values.

Many of these comments and references can be interpreted as deriving from stories or narratives alive in society: for example, society's goals and, incentives or what we measure, and comment on daily versus what is ignored or hidden. There were many suggestions that notions of growth can be reconceived so that GDP and short-term financial returns are less of a focus and we become more aware of social and environmental impacts. There were observations that 'we are currently fed/schooled in the growth paradigm', whether it be through advertising, education, day-to-day choices or the incentives implicit in our legal, political and economic structures.

Governance, adaptive capacity and our choices enable growth

Some said that good governance, and a capacity for flexibility and adaptability, support civil peace needed for growth. Our relationships with the rest of the region and our choices in the next 50 years were seen to be important factors in enabling peace and growth.

There were comments on the interplay between governance systems and leadership; good governance systems enable good leaders and leadership, and vice versa. Some of the implied goals when discussing governance included more cooperation, less combativeness, more diversity and inclusiveness, more innovation, more emphasis on long-term timeframes, reduced dependence on natural resources, and revising existing structures such as copyright law (especially in the face of rapid technological change). Taxation reform to ensure long-term value to communities from short-term windfalls such as mining booms was also suggested.

The development of new legal models, for example for shared ownership, was identified as a possible pathway to greater economic diversity, access to economic opportunities, and the inclusion of non-monetary contributions to human well-being. There was a reference to opportunities to provide more vocational training to support new technologies, again with an emphasis on growth in wellbeing rather than growth in GDP.

There were questions about appropriate levels of dependence on government: a 'nanny' state with subsidies and 'government taking care of us', or increased independence from government? For example, 'can growth be through and with government planning' or is a smaller government with less regulation and an intention to 'get out of the way' needed for growth?

Growth fuelled by destruction

The question was asked 'if we are having growth in the economy and society, is it being fuelled by destruction'? This picks up on the common theme that growth pathways come with (and perhaps are only possible because of) unwanted consequences such as environmental degradation and resource depletion. Participants struggled to see growth paths that could disentangle beneficial growth from unwanted impacts.

Catastrophe or restraint may trigger or enable growth pathways

Participants saw the possibility of catastrophe triggering the innovations or other changes needed for growth. This shock could be the result of domestic conflict caused by growth in inequality or come via global connectivity to conflicts or other catastrophes.

There were also references to the relationship between growth and restraint, with participants saying that restraint in some areas can allow growth in others, or that growth in some areas necessitates restraint in others. Participants referred to a 'yin/yang' relationship

between growth and restraint, or a cycle of oscillations between catastrophe, restraint, transformation and growth.

Questions of ethics, responsibility for sustainability and equity

Participants raised questions of ethics and responsibility, and it was described as a 'morally challenging scenario'. Examples given included: one person's desire for growth can be at another's expense; growth in multinationals can be at the expense of small business; or short-term benefits from growth can be at the cost of long-term unwanted impacts. Questions and comments of this kind included:

- 'Who should take responsibility for sustainability and equity in this scenario? We are all engaged in the benefits. What are we prepared to give up? Jet plane travel? iPhones?'
- 'On what scale do we think about our growth footprint—if we import our material goods, should we be responsible for the emissions?'
- 'Existential crisis about meaning and aspiration associated with current growth pathway'
- 'The world has overshot its 'carrying' capacity. This is not just an issue of population growth. Individuals are consuming more—the huge increase in middle classes in India and China catching up with western levels of consumption. This raises huge moral issues for us in the west.'

One response to these ethical questions was again to emphasise alternative definitions of growth, including growth in more equitable allocation of resources, or growth in sustainable and ethical investment.

Finding balance in growth scenarios is difficult

Participants recognised many hazards associated with growth futures and wanted to imagine pathways in which we can pursue 'positive growth' without unwanted negative consequences of growth. This was identified as one of the biggest challenges participants struggled with.

Summary

When comparing with other archetypes, participants described the most difficulties with conversations about growth futures. While there were acknowledgments that 'growth has been overwhelmingly good', there was far greater emphasis on the downsides of growth and participants wanted to identify growth futures that emphasised benefits with minimal unwanted impacts.

There was a strong emphasis on definitions and measures of growth that include more than material or economic dimensions. Participants spoke of growth in energy and resource efficiency, growth in the quality of non-material aspects of life, growth in equity and

opportunities for all rather than a privileged minority, and a growth in long-term focus rather that maximising short-term benefits.

Connectivity was identified as a key feature of growth futures, bringing the world closer together through more diverse ways of connecting with each other, but also bringing more social isolation and weaker local connections due to a greater focus on virtual connections.

Technological change was assumed to be underpin growth futures, with technology playing a particularly large role in enabling connectivity, new and more efficient ways of accessing and using resources, improving the quality and length of life and helping us see the world in new ways (e.g. new ways of monitoring, surveillance, measurement and making use of big data).

Finally, ethical dilemma and questions of responsibility were far more apparent in this archetype than others.

Archetype: Restraint

Brief overall impression

Citizens exercise collective restraint for the long-term benefit of all. Societies and ecosystems alike reap the benefits. There is a risk of losing individual autonomy unless social, cultural and technological innovations foster a wise mix of individual freedoms and collective benefits. This future is technically feasible, but there is mixed opinion on whether humanity could or would implement the needed social innovations.

Overview of restraint futures

What does a restraint archetype mean to you?

There were strong and diverse reactions to the word 'restraint'

Some participants heard 'restraint' as the imposition of a strict set of moral judgments and it brought to mind unpleasant memories of experiencing a strict (e.g. religious) upbringing. Some said 'it is not a good word'. Some said they had strong, negative reactions to any implication of restraint being imposed. Many of the images (provided on the day to stimulate discussion) were interpreted as being utopian, and perhaps at odds with a word like 'restraint'. A potential tension was recognised: 'do we only get to a beautiful environment, utopia, via restraint?'

A key reason given for exercising restraint was the expected long-term societal benefits of protecting ecosystems, cultures, health and opportunities

Many reasons for exercising restraint were given, including protection of ecosystems, cultures, health and opportunities, via seeking environmental sustainability and improving social equity, which were expected to lead to long-term societal benefits. Resource limits were given as a rationale for why restraint is required to achieve these environmental and social ends. There was widespread acknowledgment of the existence of limits, but some participants questioned whether such limits would be recognised more broadly across Australian society and whether there would be the capacity to act on that knowledge before reaching and exceeding limits. For some participants 'restraint' was interpreted as keeping things the way they are now, and others suggested it could represent a reversion to past ways of life (e.g. simpler living, traditional practices and greater self-sufficiency or war-time 'make do and mend' culture). Others did not see it as reverting to past practices or staying the same, but emphasised the potential for restraining undesirable impacts of current Australian society via technological means, such as increased use of renewable energy.

Participants emphasised the importance of framing restraint futures in a positive light, looking for win-win motivations for pursuing this future rather than a fear of scarcity

'Restraint' or 'discipline' was described not as the end goal, but rather a means to desirable outcomes. Participants wanted to see the desirable benefits highlighted rather than have a focus on being restrained. Participants spoke of the fulfilment, wellbeing and opportunities that come from people thriving in healthy, living environments. They suggested that restraint itself does not need to have negative connotations as the challenges of restraint can accelerate innovation and creativity, and can itself be framed in ways that bring out this potential. Having the capacity to exercise restraint can increasing one's options, and so can be interpreted as enabling increased freedom. Some even suggested it could be fun, and saw the potential for empowering different forms of participation in society. Some expressed a strong preference for exploring these kinds of empowering possibilities, and were reluctant to explore alternative ways to frame this archetype.

There are reasons for restraining undesirable impacts of human activities but few reasons to restrain desirable impacts and activities

Generally, participants suggested that material consumption, energy use, resource-consuming aspects of mobility and degrading types of land use need to be limited in the future. On the other hand, participants saw no reason for constraints on exploratory thinking, ideas, knowledge, common sense, dissent and debate. Participants were careful to try and distinguish material restraint from social restraint, recognising that there are interactions between the two. For example, being connected is not usually considered to be a form of consumption, yet there are underpinning material and energy requirements.

Another issue at the nexus between social and material restraint is the question of population size. In particular, participants spoke of the benefits of a lower population, pointing to less pressure on natural resources and ecosystems, suggesting we'd require fewer restraints on resource use were we to limit population size.

Restraint is not simply restriction of growth: restraint in some areas may promote growth in others, in both desirable and undesirable ways

Participants recognised many trade-offs where restraint in some aspects of life allow growth in others. For this reason, restraint was not seen as a trivial opposite to growth, but instead participants emphasised what opportunities can grow as a result of chosen restraint in some areas. A trade-off that attracted particular attention was that of short-term individual benefits and long-term collective outcomes. There were references to free riders benefiting from collective restraint and thus undermining the intended benefits of that restraint. Some anticipated the need for governance mechanisms to ensure collaborative or collective efforts that are not vulnerable to free riders.

Notions of 'restraint' are relative, culturally variable and context dependent

There was also acknowledgment that notions of restraint are relative, culturally variable and context dependent. We already live with imposed restraints such as available time and money. On the other hand, what is considered 'restraint' in Australia would be experienced as abundance in other cultures or in earlier times in Australia (e.g. social norms around house size, material possessions, vehicle ownership). In the global context, would we have the option to choose a restraint future in Australia if the rest of the world chose a different path?

What might a restraint future look and feel like?

Some participants commented that there were 'too many photos of nature and idealised children' in the images provided to stimulate thinking about this archetype.

The images provided by the workshop organisers to stimulate thinking were chosen to reflect a range of interpretations of the Restraint archetype. Some images were to reflect authoritarian regulation, such as 'no birthing' signs, and images of war-time rations. Some images referred to processes for sharing resources, such as collaborative consumption, or governance methods for accessing common pool resources. Some were about chosen restraint, such as meditation and mindfulness practices or a diet of local seasonal vegetables, and others highlighted potential benefits of restraint (e.g. brilliant star-lit night sky untainted by air pollution, a child jumping in the waves of an undeveloped beach, and wild places in nature). Some participants commented that there were 'too many photos of nature and idealised children'.

Less material consumption, more active and healthy communities

Participants gave detailed descriptions of society in possible restraint futures. These included:

- fitter, healthier population with fewer diseases of affluence
- more vibrant community life
- a greater emphasis on sharing and collaboration
- less emphasis on consumption, and less social acceptance of conspicuous consumption
- more emphasis on experiences than material consumption
- more social connection and fulfilling relationships
- more consideration for others, and a 'change in the tone of the conversation'
- more participation in decision making, especially at local scales, greater acceptance of regulation
- greater willingness to forego self interest for the greater good
- environmentally sustainable living practices

- greater understanding of the distinction between needs and wants
- efficient use of resources.

Local, seasonal food

Food received particular attention. Participants imagined a more decentralised food system, favouring local production and distribution and an end to the supermarket duopoly in Australia. Eating food in season, reduced meat consumption, and less consumption of processed food were described as restrained dietary choices, in that there would be reduced choice in favour of improved quality, freshness and health impacts. Vibrant local economies, increased autonomy, more self-sufficiency and reduced waste were described as desirable outcomes from that restraint. Participants imagined more urban food growing and community gardens.

High density living, active transport, mass transit systems, urban food production

Descriptions of building and transport infrastructure were primarily focused on urban settings and included:

- high density living
- more mass transit systems, e.g. public transport
- more active transport (walking, cycling)
- urban planning to accommodate urban food production
- less use of energy-intense climate control systems such as air-conditioning and heating systems
- buildings and technology that have lower energy and material requirements
- more off-grid and distributed energy production
- more effective recycling and waste management.

More jobs in repairing and reusing products, knowledge-based work and collaborative consumption

In describing the economy, participants imagined that recognition of material limits will lead to greater value being placed on human labour, including a shift away from planned obsolescence towards greater repairing and reuse of products, and a shift towards 'experiential consumption', knowledge-based endeavours and meaningful social interactions instead of material consumption. Participants also imagine more of a shift towards economic instruments for collaborative consumption (e.g. shared access to vehicles or equipment in the neighbourhood) and shared access to resources (e.g. community land trusts, public spaces such as libraries, parks and other shared facilities). Some imagined a future with little or no GDP growth, perhaps requiring redefinition of growth and notions of formal employment.

More equitable income distributions, volunteering and social safety nets

There was also an emphasis on increased equity, fairer income distribution, more volunteering and social safety nets. The prospect of enforcing restraint on others in less privileged positions raised ethical considerations. Restraint on the many imposed by the few was viewed as unacceptable, and participants wanted restraint to be founded on consensus: 'everyone has to be in it together'. It raised questions of how to provide opportunities in a restrained world for those who are currently experiencing material poverty. There were also questions of impact on an ageing population, and what restraint futures will mean for duration of working life, lifestyles of those in retirement, health care and work force implications.

More consideration for one another

Participants imagined restraint futures would see people being more considerate of one another, citing considerate behaviour seen in high-density cities such as Tokyo. For example, dual families occupy houses, pedestrians and motorists manoeuvre in ways that allow highly effective coordinated movement in congested conditions.

Closer links between aesthetics and function OR separating them altogether?

Some referred to more down-to-earth aesthetics, suggesting there'll be greater emphasis on natural products (e.g. wood, wool) and more exposure to visceral human qualities such as touch and smell due to higher density living. Some suggested the quest for restraint will see us separating out pleasure from functionality (e.g. in eating) so that each can be met with minimal resource requirements.

Long term benefits, short term inconvenience

Matters of time scale were also raised. In particular, the risks and benefits of restraint operate on different time scales. Benefits are long term, but inconvenience and other downsides are immediate. Time discounting is inherent to human nature, and so any restraint future will have found a way of minimising the effect of time discounting and favouring long planning horizons.

How might restraint futures come about (i.e. by which possible pathways)?

Pathways are influenced by enablers, constraints, plausibility and probability

When considering pathways participants gave detailed commentary on barriers to and enablers of restraint, and assessments of plausibility and likelihood of restraint futures.

Restraint futures are unlikely

As a general rule, participants saw restraint futures to be quite unlikely, suggesting that freedom- and space-loving Australians will find restraint difficult. They suggested that people are unlikely to exercise restraint without some kind of external imposition, and any such imposition will create greater inequality and political unrest. While some may be prepared to exercise restraint voluntarily, participants recognised that environmental and social impacts embodied in our consumption are largely invisible at the point of purchase. Furthermore, participants suggested that those who are materially comfortable are more likely to be open to restraint than those who are already strongly economically constrained (or perceive themselves that way).

Restraint futures may not be effective

Some were not convinced about the effectiveness of particular aspects of restraint futures that had been described. For example, some asked whether urban food production was really viable for feeding a whole population, and there were a range of views on this point. Where changes might be technically feasible, participants wondered about the effectiveness of such changes (e.g. the limitations of collaborative consumption markets).

Necessity is a likely trigger for restraint futures

Participants listed many potential triggers that could lead to a restraint future. 'Necessity' was high on the list of triggers. History shows that shared adversity, such as water limitations or wartime conditions, foster a willingness and ability to exercise restraint. Hard boundaries such as petroleum scarcity or crises like bushfires, food shortages, war or inequity-driven social unrest were given as potential triggers of this kind. Rising prices were another suggested trigger, pointing out that scarcity drives prices up. In general participants suggested that people are unlikely to change unless forced to, so either price or crisis were seen as most likely triggers. There were suggestions that leadership, technology or changing social and cultural norms could provide alternative triggers.

Human nature and societal structures are barriers to restraint

Many barriers to restraint were described. These included aspects of human nature: lack of imagination, preference for short-term convenience over long term benefits and an unwillingness to change unless forced to. Participants said there is neither political will nor broad electoral support for restraint. Some suggested we've also lost many of the skills necessary for restraint (e.g. domestic science) and our work, urban and marketplace structures now present real barriers to restraint. For example, many cited long hours at work, long commuting times and time costs as being reasons for high levels of convenience consumption (e.g. buying pre-prepared processed food at Coles rather than preparing home made meals from raw ingredients purchased at a local farmers market). Political cycles

currently favour short-term outcomes, and planning horizons that span a lifetime or longer are rare in Australia.

Design, planning and other kinds of social and human capital are enablers of restraint

Participants also named many enablers of restraint. They pointed to the role of design and planning in particular, pointing out that investment in social and built infrastructure that makes restraint easier would be helpful (e.g. good mass transit systems, building codes, 500-year plans). They also pointed to other examples of social and human capital that enable restraint: innovation, strong social bonds, education, research, 'a more complete view', sense of responsibility, leadership, access to opportunity and social participation. And again, resonating throughout many of the conversations was the awareness that restraint will not happen without widespread support.

Values and social norms underpin barriers and enablers of restraint

Human nature and societal structures were seen as both barriers to and enablers of restraint futures, and in general participants spoke a lot about the changes in values and social norms that would be needed for such futures to occur. Participants pointed to current social norms that reward material consumption and immediate gratification of fleeting desires, and downplay values such as prudence and temperance. Asian and Swiss ways of life were given as examples of very different cultures to ours, where values of consideration for others and other forms of restraint are stronger. Participants made several clear statements about the need for a change in cultural values or mindset. They spoke of moving away from 'I' to 'we', moving towards greater acceptance of regulation and away from material consumption to valuing experiences and nature. The conversations were about our identity, how we view ourselves and what values we reinforce. Some were more strident in their calls to change others' values and mindsets, wanting to see us more openly challenging our values and expectations and making it a focus in education to guide changing values.

There were questions around generational change. Recognising that generations can define themselves in contrast to their parents, young generations may actively choose to live a lifestyle that values restraint.

Discipline is a desirable skill, so some aspects of restraint can be valued by some people in all futures

Many participants spoke of restraint and discipline as valuable skills in their own right. The discipline of practising a musical instrument increases the skill and opportunities to express oneself through music. Those who practise various forms of mindfulness, such as meditation, talk of such practices building the strength to face difficulties with a peaceful mind. These were contrasted against hedonism, and habits of consuming to avoid aversive situations. References were made to various addictions in our culture, including the

growing addictive component of connectivity to the internet. A degree of self regulation or self discipline actually provides more capacity for freedom of choice and opens up opportunities that are not available without some capacity for delayed gratification.

Pre-emptive anticipation and collaboration across society are preferable to having restraint imposed by necessity or authority

There was a strong preference for being able to anticipate limits and take pre-emptive action to restrain ourselves. Choosing the manner in which we exercise restraint was seen as being far preferable to having necessity or authoritarian structures impose it. Given the aversion to imposed restraint, collaborative methods were given as the most desirable of pathways to restraint. There were many references to collaborative consumption, with an emphasis on shared access to or fractional ownership of material possessions.

Governance pathways: top-down or bottom-up?

There were mixed views on the governance arrangements in such futures. Many comments were made about heavy, centralised or imposed governance mechanisms being necessary to achieve restraint futures as few individuals voluntarily restrain their activities. There were references to strict controls and regulations, more complicated legal restraints that impinge ever more broadly on life and severely limit on individual freedoms and thought. On the other hand, many spoke of such futures having more decentralised governance, more emphasis on governance at bioregional and local scales, with a high level of citizen participation in decision-making. Some pointed to how this might be possible without requiring strict rules and regulations. These differences were discussed as trade-offs between top-down and bottom-up approaches. Participants said that top-down approaches may have more control, but bottom-up approaches have the benefit of grass root level vision, support or consensus. Recognising that some issues benefit from governance at a global scale while others are best resolved locally, some pointed to a wise mix of both. There was also a suggestion that ongoing tensions between bottom-up and top-down approaches are useful, driving innovation.

Some of the differences were related to questions of responsibility: where does responsibility lie? Some spoke of an over-reliance on government and not enough sense of responsibility in different sectors, communities and individuals, and wanted to foster a broader sense of responsibility outside government. There were references to wider democratisation through technology and more effective access to information.

Many possible instruments for change: restrictions and regulations, market instruments, investment incentives, collaborative consumption, whole of life cycle management

Most of the specific mechanisms identified for restraint were regulations, restrictions and penalties. There were references to rations, permits, physically limiting availability of

parking, roads and rubbish bin size, banning particular products and imposing limits on number the children per family. Participants spoke of greater surveillance and more stringent polluter-pays requirements (including finding ways of curbing non-point sources of pollution).

Other suggestions emphasised incentives to make it easier and cheaper for those who are making less resource-intensive choices. More generally, markets and pricing mechanisms were given as ways of changing behaviour, including requiring various certification or accreditation procedures for products in the marketplace. Requiring whole of life cycle management was seen as a way ensuring businesses take responsibility for the waste and other unwanted impacts associated with their products.

Participants raised issues of social acceptance of regulation. In some cases clear communication of the need for restraint has been sufficient to bring about high levels of cooperation (e.g. water restrictions when all can see lowering dam levels). Some saw potential for individuals to appreciate the benefits of restraint, pointing to the growing popularity of software and mobile phone apps designed to help foster greater focus and self-discipline (e.g. by limiting internet connectivity, or setting up peer-to-peer support networks, or providing reminders and incentives to build new habits). In this way some participants saw potential for widespread support for fair restrictions intended to deliver long-term public good.

Free riders were an acknowledged risk associated with collective restraint. There were several references to collaborative consumption systems, which are forms of collective governance that pay particular attention to minimising these risks. There was little reference to other mechanisms specifically designed for effective governance of common pool resources and other public good outcomes, although several participants stressed the importance of design, so that what is easiest for people contributes to the long-term common good rather than eroding it.

Greater awareness of the impacts of decisions could be a powerful driver of change

Much was said about the visibility, or lack thereof, of the impacts of our choices. Many pointed to the value of increased education and awareness of supply chains and impacts on ecosystems and people. Participants said that purchases are made in ignorance of unanticipated consequences and hidden impacts, and crucial to such awareness-raising is the need for better measurement and communication of information. Some thought that making social and environmental impacts more visible would see shopping decisions based on impact and quality rather than price. Others pointed to the potential to use such information to expose people socially and induce feelings of shame, so that it becomes less socially acceptable to be a conspicuous consumer or to be wasteful. Others suggested that the information on impacts is best embedded into pricing structures or stewardship and

accreditation requirements so that true costs are reflected in the market price and are not left to the conscience of individuals.

The role of the media and advertising in shaping consumer choices received scant attention, with only one mention of the current power of media manipulation, although broader references to communication of information were common.

Restraint-driven innovation can drive change

Participants pointed to scarcity and the need for restraint as powerful drivers of innovation, particularly if it drives design goals to be more about resource and energy efficiency (e.g. renewable energy, smart buildings). These are not just technical innovations, but also social innovations and the exploration of new governance mechanisms (e.g. development of the share economy). Participants referred to strong interconnections between social and technical innovation (e.g. mobile communications facilitating social movements such as the Arab Spring, or IT platforms enabling new forms of digital democracy).

Lock-in, inflexibility and perceptions about the risks of change could favour the status quo

There were a couple of references to lock-in to current ways of life, and questions about how reversible or flexible these are (e.g. car-based transport, energy and water infrastructure). There was a suggestion that restraint is not to be confused with risk aversion, and that to be able to change we will need to take risks to try out new ways.

The ways in which humans think and act, collectively and individually, create large uncertainties about how the future might unfold

The conversations considered aspects of human psychology and behaviour that could influence pathways into the future. Participants recognised that psychological defences are triggered quickly by anything that resembles moral judgment, and they acknowledged dangers in trying to change social norms via moral exhortations. On the other hand, they pointed to clear benefits in having more capacity for collective choice, yet most of the mechanisms participants referred to involved imposed regulations and restrictions.

The hidden impacts of consumption and other choices were well acknowledged. One conversation made specific mention of an even more difficult challenge: system rebound effects. The accompanying example was that money saved through energy-saving or other environmentally beneficial technologies is generally spent elsewhere (e.g. air travel and holidays), ultimately increasing environmental impact. A concluding comment from this conversation was 'This is only avoidable by actually NOT spending money saved.'

It is not possible to get to one archetype without visiting some of the others

Participants were well aware that these archetypes are not independent of one another. All four are happening concurrently, depending on where you look in the world. Some suggested it's not possible to get to one archetype without visiting some of the others. More specific examples included: growth can trigger catastrophe, catastrophe can trigger restraint, restraint can trigger innovation that supports growth or transformation, or restraint can avert catastrophe. Restraint was not seen as a simple opposite of growth, and some saw restraint as growth in different areas such as growth in quality of life, growth in community.

Summary

In conversations about the future, how a concept like 'restraint' is framed is very important. Many of the discussions were about language and our interpretation of what is meant by 'restraint'. If the restraint is due to top-down imposition of strict moral judgments then it is highly undesirable and to be avoided. On the other hand, if restraint is a collective choice to maintain and protect ecosystems, health, cultures and opportunities for the long-term benefit of all then that is a far more desirable future, and many were able to provide very detailed descriptions of the benefits. Hence there was a lot of emphasis on how to frame restraint futures in win-win way, and most of the descriptions of what restraint futures would look like dwelt on these desirable outcomes.

When it came to discussion on the specific mechanisms for restraint at a societal level, most of these were about strong government regulations and restrictions. There were some references to market instruments and ways of ensuring prices better reflect unwanted impacts of material consumption. Other emerging mechanisms such as ecosystems stewardship and accounting frameworks and collaborative consumption platforms were also discussed.

In general participants expressed doubt that we can find ways to overcome aspects of human nature that work against collective restraint, referring often to the current dominance of values such as immediate individual convenience and pleasure, rather than long-term benefit to all. Our social norms and political and planning cycles were seen to be reinforcing these short-term individual wants and rendering long-term impacts invisible. It's not that costs of restraint outweigh benefits, but rather the mismatch in scales (me/here versus everyone/later) gives the short-term costs disproportionate influence.

For these reasons participants pointed to ways of making unwanted impacts and costs more visible to all, via better information gathering, availability and communication. Some suggested this information would be to create social exposure and trigger shifts in cultural norms, and others pointed to this information being a key part of more formal or binding structures such as national ecosystem accounts and accreditation requirements.

Finally, restraint in itself was seen by many as a useful capacity or skill to develop, and not something to be minimised. It may seem counter-intuitive, but having the option to exercise restraint actually increases, not diminishes, our options and provides a useful contribution to our adaptive capacity and resilience. Furthermore, embedding resource constraints as goals in planning and design triggers the innovation and imagination required to find new ways of living within our means. Anticipating the benefits of restraint and finding ways of fostering chosen, collective restraint was seen to be a less likely, but more desirable pathway than having restraint left as our only option, imposed by catastrophic necessity.

Archetype: Catastrophe

Brief overall impression

It is easy to think of how catastrophe futures might come about, and there are many and varied possibilities. Shocks and emergencies are typical triggers for catastrophes, but their impact—e.g. whether they lead to further catastrophes and even societal collapse or are stimuli for adaptation and/or transformation—depends on how prepared society is for them (e.g. what built infrastructure and human, social and natural capital is available).

Overview of catastrophe futures

What does a catastrophe archetype mean to you?

Notions of catastrophe are relative, and sometimes a good thing

Participants said that whether a situation is considered a catastrophe or not is a matter of interpretation. Technological breakdown, such as no access to the internet, might be considered a catastrophe in many parts of Australian society, but most humans throughout history have never experienced any dependence on the internet. It was also suggested that if nothing were to change in Australian society by 2050, that stagnation could be interpreted as a catastrophe. On issues such as climate change, it was suggested that some would see it as a catastrophe if we do not act to reduce emissions, and others see it as a catastrophe if we do. Many communities around the world are experiencing catastrophic situations where their lives are at risk. Participants acknowledged that we are viewing 'catastrophe' through a very privileged lens. What some consider is a catastrophic situation may represent mere inconvenience or life as usual for others.

There were also suggestions that aspects of catastrophe can be interpreted as 'a good thing'. Economic collapse or the collapse of white male dominated groups of power were suggested as forms of collapse that could be interpreted as a good thing by some. Catastrophe was also recognised as a potential source of opportunity (e.g. opportunity for transformation). In many situations where there are winners and losers, the winners won't interpret events as catastrophic, whereas the losers will. If a situation occurs that the majority don't want, but a minority benefit hugely from it, that can be considered a collapse of democracy.

Difference between natural disasters and social catastrophes

Where some catastrophes are natural disasters outside human control (e.g. volcanoes), others are about collapse in human social capital (e.g. collapse in democracy). While some questioned whether natural disasters are relevant, most responses suggested that it is useful to consider both. In particular, the capacity to anticipate catastrophe came through as a strong factor influencing the quality of our response (including possible prevention), and both kinds of catastrophe risk societal breakdown (from local through to global scales).

System vulnerability and resilience

There were questions about how catastrophe and collapse are related. There was the suggestion that catastrophes are events that cause harm, and collapse is about a loss of

control. A catastrophe can be a shock to a system, and whether it collapses or not depends on the quality of societal response and its adaptive capacity. On the other hand, there are human-made catastrophes that are consequences of decision and actions, which suggests these too can be prevented with sufficient foresight and capacity to act differently.

Natural environment as a source of human catastrophe, or as a beneficiary of human catastrophe

The natural environment was referred to in (at least) two ways when making sense of catastrophe futures. First, the natural environment is a source of natural disasters that have little or no human agency causing their occurrence. Other references to the natural environment were related to questions of ecosystem health and sustainability. For example, there were diverse questions about the sustainability of agriculture, whether loss of native forest or fisheries is anything to worry about if it doesn't affect human societies, and suggestions that catastrophes for humanity may allow natural ecosystems to thrive. The range in questions here suggests that in some situations participants saw a potential tension between ecosystems thriving or humans thriving, with a catastrophe for one yielding a benefit to the other, while also recognising that many human enterprises (e.g. agriculture) ultimately depend on ecosystems.

What might a catastrophe future look and feel like?

Dangerous international context

When considering characteristics of catastrophe futures, many placed Australia in a more dangerous or catastrophic international setting. They imagined other countries in a state of collapse, with impacts on us because they are neighbours (e.g. PNG), economic and political allies (e.g. US), sources of environmental refugees (e.g. island nations vulnerable to sea level rise) or sources of refugees from conflict zones (e.g. Taiwan-China conflict). They spoke of terrorism, environmental pressures (e.g. hand pollinating crops in China due to collapse in bee populations), breakdown in relationships with our neighbours (e.g. Malaysia and Indonesia), risk of fallout from nuclear conflicts between other nations, Australia being invaded and geoengineering gone wrong. There were also references to countries not complying with international conventions such as biological and other weapons, or child rights.

Ailing natural environment and high impact natural disasters

When referring to the characteristics of the natural environment, participants envisaged catastrophe futures involving natural disasters such as fire, flood, drought, heat waves and plague. They also anticipated more environmental problems such as ailing bee populations, collapsing fish stocks, toxic algal blooms, widespread pollution, collapsing biodiversity,

increased pest species and disease outbreaks, lifeless landscapes with poisoned air, climate change, increased frequency of extreme weather events and rising sea levels.

Poor health

Human health issues featured strongly in catastrophe futures. These included global pandemics, heat stress, population collapse, antibiotic resistance, impacts of natural disasters (e.g. fires, floods, droughts, plagues), mental illness, violence, obesity, low quality aged care, higher mortality rates, poor sanitation, viruses transmitted by animals and food insecurity and/or famine.

When considering population issues in catastrophe futures there were references to both high and low population scenarios. There were references to pressures from population growth, with population demands exceeding the capacity of basic infrastructure and creating resource scarcities and population health problems. There were also references to higher mortality rates perhaps leading to population declines.

Collapse in built infrastructure

Participants anticipated collapses in built infrastructure. These included transport, food, water, information technology, waste, sanitation, security, electricity, internet, communication and purchasing systems. There were references to over-crowded cities overwhelming the capacity of the underpinning infrastructure.

When describing these system failures, participants imagined lifestyles that are more focused on meeting basic needs of food, water and shelter. They imagined urban and rural residents being cut off from one another, perhaps due to transport system failure coupled with declining rural populations. There was a description of urban populations living in squalid suburban slums with only basic, if any, sanitation or water and electricity supply services. Agriculture, food production, distribution and refrigeration received particular attention, and participants imagined futures involving high levels of food insecurity, and even cannibalism.

Information technology systems fail us: either we rely on them and they collapse, or the systems are used against us.

On the one hand, participants referred to information technology (IT) systems as vital infrastructure underpinning our communication, economic, transport and social systems, and spoke of the dire consequences of collapse in IT systems.

On the other hand, IT systems were also potential contributors to catastrophe, via cyber-warfare attacks, increased surveillance and control of citizens and loss of privacy. Participants referred to a general failure of laws, regulations and social norms in keeping pace with rapid technological change.

Collapse in economy

Participants imagined a future featuring global financial crisis, loss of confidence in money, hyper-inflation, high levels of income inequality, devaluation of currency, widespread unemployment, vibrant black markets for scarce resources (e.g. gold, drugs, petrol, food, medicines), loss of economic access to food and a high level of profiteering from elites in privileged situations.

Governance: various forms of collapse or authoritarian rule

Discussions on governance covered two extremes. There were descriptions of total collapse or breakdown in government, leaving people to fend for themselves. This is a picture of an absence of government, or anarchic structures operating at the individual or community scale. At the other extreme participants referred to very strong, authoritarian government, where individual surveillance, dictatorial leadership and strict limitations on individual rights and freedom of speech are commonplace. Common to both descriptions is the absence of any democracy or collective governance mechanisms aimed at serving societal needs.

Other variations included references to weakening or breakdown of the Australian federal system of government via secession, balkanization, increased power of corporations or widespread non-cooperation with laws and regulations. Other factors given as influences on governance included a lack of community representation in government, lack of government support for education, government failure to include diverse multicultural communities and increased foreign ownership of Australian land and institutions.

There were also many references to the media, political and social system failing to communicate, convey relevant information or foster any kind of meaningful public discourse on matters of importance. Instead there would be rumour and fear mongering, suppression of access to information and proliferation of politically expedient misinformation.

Everyone for themselves

There were many references to people being unwilling to take responsibility for anything or anyone but themselves. Selfishness is the norm, with little or no generosity in society. People act in their own immediate interests and stop cooperating with any laws or contributing to any social cohesion or civility. Refugees are not welcome and treated harshly. There is little or no sense of collective responsibility, people have lost faith in government and the 'blame game' is thriving. There was the suggestion that Indigenous people may benefit from being left to themselves rather than being the subjects of government intervention.

Widespread inequity, poor quality of life and growing security risks

There were many references to growing inequity, whether it is in income distributions, employment opportunities, health, security or access to key resources, infrastructure and services. The elderly and those on low incomes were seen to be most at risk. There were references to a growing underclass, and disconnected, narrow groups of elites protecting themselves and serving their own desires at the expense of the majority. There are no social support systems for unemployed, those with disabilities or those facing other socio-economic disadvantages.

Participants described low quality of life for most: little happiness, much misery and distress, high unemployment, no leisure, overcrowded conditions, high levels of violence and homelessness, and growing uncertainty and insecurity in a scarred landscape and urban environment.

High levels of conflict

Conflict featured strongly in catastrophe futures. These included riots and violence driven by political and financial unrest and personal insecurity. There were descriptions of democracy suspended, people taking things into their own hands, having no respect for one another and resorting to violence of all kinds. There were descriptions of more resources being diverted to military activities and security, and Australia 'under siege' from refugees or invasion.

Bringing out the worst in each other

The overall picture is a society that no longer supports collective wellbeing, but rather brings out the worst in individuals. Psychological distress and associated disorders are the norm. People resort to any means to secure immediate needs for themselves and their children, with little or no sense of compassion or generosity towards others (and even using others' misfortunes as a form of entertainment). In these imagined futures, disasters don't foster heroic acts of courage and strength, but rather bring out destructive behaviour and stories of blame. People are divided rather than united in times of trouble in these futures, there is a lot of cultural intolerance and a loss of childhood and formal education systems. It is a collapse in social infrastructure, or social capital, and people are unable to imagine life any other way, accepting it all as a fact of life.

High system vulnerability, loss of resilience and adaptive capacity, and absence of learning

As well as identifying specific characteristics for different aspects of life in catastrophe futures, participants referred to system-wide characteristics. The loss of built and social infrastructure, and the breakdown in connectivity (both loss of trust and degraded quality of relationships and the physical connectivity via transport and communication systems) was

seen as an erosion of system resilience, making society as a whole more vulnerable to shocks. Extremely limited capacity to absorb shocks, recover and adapt was seen to be a key aspect of catastrophe futures. This would be associated with higher uncertainty, lack of predictability and lack of preparedness for further change. Systems for learning (either formal education or other means of building and sharing knowledge) are weak or absent, yet learning systems are vital ingredients for being able to work with uncertainty, anticipate, adapt and change. These system characteristics in themselves set up pathways to catastrophe.

By what possible pathways might a catastrophe future come about?

Events outside Australia bring catastrophe

Participants referred to potential events outside Australia's influence that bring about catastrophe futures. The most extreme of these saw Australia as the target of military conflicts, invasion and war. Diseases, such as a new flu virus or nuclear fallout from Asia, were also mentioned as possible direct contributions to catastrophe in Australia. Catastrophes in other parts of the world that create a flow of refugees to Australian shores were described as another destabilising influence. Unhealthy political alliances and trading relationships with other nations were seen as another potential source of strife, particularly if they involve us in conflicts between other nations. Global financial collapse was another commonly referred to contributor to catastrophe.

Environmental change fuels catastrophe

The natural environment featured in many of the pathways to catastrophe futures, often as a consequence of human impacts on the environment. Examples included loss of natural ecosystems and biodiversity, mass extinction (including collapse of major fisheries), overuse of freshwater supplies, reduced availability of natural resources, and impacts of waste and pollution, all driven by unrestrained growth in material consumption. Natural disasters such as volcanoes were also given as potential triggers for catastrophe, and human actions were also seen to be increasing the frequency of other natural disasters (e.g. fires and floods via climate change). Sustained climate change was seen as a drain on human, social, natural and built capital, with people 'run down' by continual climate-related events, 'sapping our ability to do more constructive things' and bringing long-term impacts to our agricultural systems. Growing population was seen to be a pressure on resources and ecosystems.

Long fuses, cascading impacts and multiple whammies

Many participants described more complex pathways than simple stories of 'event causes impact'. Cascading chains of cause and effect were common. An example given of such a chain was population growth leading to environmental impacts on food supply and then

social collapse due to food insecurity. There were other references to 'long fuse, big bang' pathways, where there is barely noticed, incremental change that accumulates until a critical point where major, irreversible change is unleashed. Examples include long-term, gradual erosion of built or social infrastructure until critical failing points are reached (e.g. long-term weakening of democracy or degradation of electricity or water supply infrastructure). Finally, participants referred to 'multiple whammies' where there are several intersecting and interacting forces that together create an unmanageable confluence of events. For example, rapid changes in environment, health and international security together cause the collapse of the insurance industry.

The terms 'long fuse, big bang', 'ramifying cascade' and 'multiple whammies' were used in the book published from Phase 1 of the Australia 2050 project (https://www.science.org.au/publications/negotiating-our-future-living-scenarios-australia-2050), citing work on the architecture of global crises by Thomas Homer-Dixon and colleagues. These terms will be referred to again in descriptions of pathways.

Many of the characteristics reinforce pathways, particularly via poor quality responses

Closely related to the idea of 'ramifying cascades', there was the recognition that society's response to a difficult situation can often make things worse. Many of the characteristics of a catastrophe future can themselves drive individual and societal responses and behaviour that amplify conflict and collapse (e.g. a catastrophic event bringing out the worst in people, so creating ongoing, worsening catastrophe). In particular, participants said that poor quality government or community responses to crises would be a pathway to expanding catastrophe and collapse. This was a strong theme apparent in many of the responses.

An erosion of adaptive capacity creates vulnerability

Closely related to the idea of 'long fuse, big bang' pathways, participants spoke of futures involving the loss of capacity to accommodate change. Where there has been erosion of that adaptive capacity, for example through degradation of built or social infrastructure, it leaves people and communities more vulnerable to catastrophic outcomes from even minor shocks or disturbances.

Aspects of adaptive capacity mentioned included:

- insurance systems
- systems for maintaining and improving critical infrastructure
- investment into exploring alternatives to dependence on non-renewable resources
- risk assessment and planning
- a culture of learning from past mistakes and creating environments where it is safe to fail, for the sake of learning, testing systems and building resilience
- taking a precautionary approach to biodiversity and environmental management

- building systems resilient to anticipated shocks (e.g. dependence on 'just in time' supply chains for food and oil may be economically efficient in good times, but such systems are not resilient to shocks and disruptions)
- management of population pressures on environmental and social systems.

Anticipated vulnerabilities associated with eroding adaptive capacity included:

- hitting resource limits
- disasters overwhelming insurance systems
- greater exposure to unwanted impacts of natural disasters (e.g. erosion of social capital increases the impacts of disasters that could be well handled if there is a strong emergency response capacity, e.g. volunteer emergency forces)
- more shocks that have not been anticipated and prepared for due to loss of capacity for foresight, prediction, prevention and strategic planning activities.

Interestingly, on matters of prediction participants spoke of a risk of communities losing faith in predictions due to a history of false or unrealised previous predictions (even if such predictions didn't happen due to society taking preventative action).

Participants focused on system vulnerability, recognising that catastrophe and collapse is more readily triggered in a vulnerable system (e.g. collapse in a particular industry, or an extreme weather event, or other events that could be more readily accommodated and adapted to in a more resilient system).

Shocks and emergencies bring about catastrophe

Many kinds of shocks and emergencies were given as events that could bring about catastrophe, particularly in systems that have already been weakened and made more vulnerable. These included: extreme weather events, meteorite hit, financial crisis, bush fires, floods, terrorism attacks, cyber-attacks and pandemics.

A failure to learn entrenches catastrophic outcomes

Participants identified learning as a key adaptive capacity, and they pointed to several ways in which our capacity to learn can be degraded, so making us more vulnerable to shocks, or amplifying the early seeds of catastrophe:

- Losing our ability to learn from mistakes, perhaps by devoting time and energy to proving we are right rather than accepting that we might be wrong: a culture of denial.
- No longer valuing and investing in learning systems such as education, inquiry and research.
- Failing to take a precautionary approach in complex systems such as biodiversity conservation (recognising that our understanding of complex interactions will always be partial and hence requires the precautionary approach).

Lack of foresight, planning and working in the face of uncertainty sets us up for catastrophe

Participants referred to an absence or failure of foresight and planning setting us up for future catastrophe. The assumption that things will keep growing and getting better without appropriate regional, urban and national planning was seen as a possible pathway to catastrophe.

Poor risk management and failure to work well in the face of uncertainty were related pathways and there were references to the fact that complex systems are difficult to predict and there are many 'unknown unknowns'. Furthermore, when an adverse outcome has been prevented, it's hard to tell whether it's thanks to preventative measures, or whether it was highly unlikely in the first place. For example, did efforts to prevent Y2K problems work, or did Y2K pose little threat after all?

Psychology drives catastrophic pathways

Participants made specific mention of aspects of human psychology that could drive catastrophe. These included inflexible belief systems, failure to empathise with others, anger, complacency, denial, faith in technological solutions, unwillingness to take responsibility, denial rather than openness to signals that we may be wrong, and lack of imagination. There were references to the psychology of risk, with three extremes being referred to as dangerous: a fear of taking risks erodes capacity to stretch our experience base and learn; excessive risk taking as a result of not foreseeing or imagining possible risks (risk taking in ignorance); and an obsession with negative predictions fuelling self-fulfilling prophecies. Wise risk assessment, planning and management can avoid all these extremes.

References were also made to notions of Australian identity, and its role in shaping behaviour. For example, either a 'she'll be right mate' attitude or a determination to see ourselves as an English colony could both manifest themselves as a blind unwillingness to adapt in a changing world.

Another psychological response that amplifies catastrophe is non-cooperation as a result of an 'everyone for themselves' mentality, and examples given by participants included: people failing to turn up to work to run vital systems, police not responding and nurses looking after their own family rather than going to the hospital. Throughout many of the descriptions of characteristics and pathways, there were references to loss of social cohesion, and a general lack of care or consideration for others, driving social disorder, disruption and violence that only fuels further catastrophe. Participants pointed to close links between the 'long fuse, big bang' description and these psychological responses, noting that where there has been long term erosion of social cohesiveness a disaster is more likely to bring out looting and other damaging behaviour, and where social cohesiveness is intact the

psychological response is very different, with no looting (e.g. New York power outages a few years ago).

Inequity drives catastrophe

Various forms of inequity were seen as potentially powerful drivers of catastrophe. These included highly inequitable wealth distributions, particular groups of society feeling disenfranchised and excluded from opportunities, a growing population of low skilled workers, and a small, wealthy elite with access to 'the good life' at the exclusion of others. Inter-generational inequities and tensions received particular attention: participants saw the possibility of older generations carrying a larger portion of child caring responsibilities, while holding the bulk of society's wealth and making it harder for younger generations to 'set themselves up', and older generations having the numbers to capture the government agenda and fail to represent the interests of younger or future generations. Notions of resource competition between generations were also mentioned, presumably referring to future generations being deprived of resources that have been exhausted by preceding generations.

Conflict drives catastrophe

There were many references to various forms of conflict being a characteristic of catastrophe futures, and conflict is a particularly potent characteristic that amplifies catastrophe, making it harder to recover. Participants cited many potential pathways to conflict: resource shortages (e.g. water), authoritarian rule, cyber-security breaches, inequity, social polarisation (e.g. ideological groups), population pressures, climate change, influx of refugees, growth of armed survivalist groups, competition for limited government funding (e.g. education vs health vs aged care vs support for unemployed), increasing prices, and accidental or deliberate unleashing of biological agents such as viruses on people or agricultural systems.

Health systems in catastrophe

There were many references to health in catastrophe futures. Health incidents such as pandemics were identified as a catastrophe in their own right, and a trigger for further, cascading pathways to entrenched catastrophe or collapse. Erosion of health systems were seen as a potential contributor to 'long fuse, big bang' pathways to catastrophe, and examples here included: hospital infrastructure not keeping up with population growth, changing demographics (ageing population) and changing health needs; and ongoing increase in antibiotic resistance.

Economic pathways

Economic impacts and characteristics were mentioned at many points in the conversations. Various economic activities and influences were also seen as potentially important drivers of

catastrophe. For example, it was suggested that pursuing economic growth as a priority, guiding principle, could lead us down the path to catastrophe. An inadequate revenue base to fund essential services and infrastructure, perhaps through an inability to raise sufficient taxes was suggested as a pathway to catastrophe. Rising prices due to resource or labour scarcity was recognised as another trigger for catastrophe, as was stock market volatility. Important industries such as fisheries or agriculture collapsing or becoming economically unviable were also mentioned. Finally, money itself was recognised as an abstract, socially-constructed concept and there was the suggestion that a possible pathway to catastrophe could be if money ceased to hold any meaning, or its meaning was corrupted by international hacking into the world financial system.

Many pathways to catastrophe seem plausible, even likely

Despite catastrophe futures being so undesirable, so unwanted and largely influenced by human decisions and actions, there were suggestions that these futures could occur quite readily via any number of pathways. In particular, the widespread recognition of feedback loops that fuel cascades of impacts, each building on the other, were seen as a particularly potent driving force for catastrophe. There were suggestions that catastrophe futures are inevitable, 'it's only a matter of time' and 'we're already there'. Others were of the opinion that 'collapse is unlikely to occur by 2050'.

Selfishness and failure to take responsibility is a pathway to loss of connection and catastrophe

There were several references to a failure to take responsibility leading to catastrophe. This included individuals assuming that it's up to 'others' or 'government' to fix things, and generally being unwilling to take any leadership initiative. This was closely related to descriptions of catastrophe futures bringing out more selfishness in people, and isolating themselves from contributing to anything that doesn't benefit themselves directly and immediately.

Losing connection to others is a pathway to catastrophe

There were several factors seen to be causing loss of physical and emotional connectivity to others and greater social isolation, which in turn were seen to be powerful drivers of catastrophe. The suggested causes for weaker connectivity include: selfishness, technical failure (e.g. loss of internet), inequity and lack of tolerance for diverse views.

Technical failures in communication and information systems were given as pathways to catastrophe, pointing to their importance as underpinning infrastructure. There were also references to the manner in which we choose to communicate and share knowledge, and how our communication practices influence pathways to catastrophe. For example, a lack of diversity in the media will see issues of national and global importance framed according to more narrow interests. Constructive conversations, and mechanisms for handling

misinformation and providing reliable evidence bases, were seen to be important in preventing catastrophic pathways.

Mix of time scales of change creates problems that reinforce catastrophic outcomes

Matters of time scale were mentioned. A sudden collapse was seen to be a problem because it requires immediate, rapid response and leaves little opportunity for exploration and adaptation. On the other hand, very gradual change is problematic as it's less obvious that change is occurring and that action is needed. There were suggestions that 'time is up' and that we no longer have time to find solutions to intractable problems. Short-term (and accelerating) media and political cycles were identified as problematic. On the other hand, social change on important matters (e.g. role of women, workplace restructuring in response to rapid technological change) was perceived to be very slow.

Governance systems are critical

References to governance were commonplace. Events that trigger the collapse of government were seen as catastrophic, the quality of government responses to events was in itself seen as a potential contributor to collapse. While strong government leadership was seen to be an important factor in preventing or safely navigating catastrophe, strong authoritarian government at the expense of democracy was seen to be a risk factor in bringing about catastrophe futures. Participants referred to the catastrophic consequences of failed governance of common pool resources such as fisheries, natural ecosystems, water supplies and agricultural systems. Similarly, the failure of societal systems such as education, health and aged care is a failure in governance for the long-term public good.

The message is that strong governance is needed to prevent catastrophe futures, and that strength comes from governance instruments and institutions that are responsive to people and long-term societal needs. Governments that are strong, in the sense that they give a lot of power to a small elite and exclude the people, are seen to be a strong risk factor in creating catastrophe futures.

Summary

A distinct feature of descriptions of catastrophe futures is the recognition that there are many ways in which catastrophe leads to unwanted outcomes that themselves increase the likelihood of ongoing catastrophe and collapse: an amplifying feedback loop that is difficult to stop once set in train. Another prominent feature of catastrophe futures is the loss of some less visible, vital attributes of society that build adaptive capacity and resilience to shocks. These included systems for learning, redundancy and buffers that may not be economically efficient in the short term but provide options and room to move in tough times. The quality of our response was seen as critical. Catastrophic events can bring out the best in humanity,

and in this way can seed transformation for good. Participants were asked to reserve those discussions for the Transformation archetype. Conversations on catastrophe futures emphasised the opposite effect, where catastrophic events bring out the worst in humanity: selfishness, anger, violence and lack of respect or consideration for others.

While various shocks and emergencies, such as natural disasters, pandemics and violent attack, were given as potential pathways to catastrophe, considerably more descriptions were about pathways of eroding infrastructure that leave society more vulnerable to such shocks and emergencies. Here 'infrastructure' refers to built infrastructure, human and social capital (including adaptive capacity) and natural ecosystems.

Archetype: Transformation

Brief overall impression

A large proportion of workshop participants thought about cultural transformation and many of those considered that Australia would be fundamentally different if its culture became truly diverse, respectful, and equitable. Technological transformations in health care and access to information were commonly considered, as were changes in Australia's governance (e.g. towards more distributed governance with a greater focus on community-driven decision-making). Transformation was seen as something that is difficult to control or predict, but it was suggested that two factors might be particularly powerful catalysts for transformational change between now and 2050: 1) changes in attitudes; and 2) reduction in current constraints on community-driven change.

Overview of transformation futures

What does a transformation archetype mean to you?

Transformation is about fundamental change

While participants found transformation a difficult concept to apply to a nation, they understood that it implies some sort of fundamental change to Australia's activities and identity.

Transformation can be good and bad, or both

Participants focused on transformation futures involving desirable change, since undesirable transformations were the focus of the Catastrophe archetype. However, it was recognised that even transformations that are desirable for some parts of society are not necessarily desirable for all people at all times.

Australians tell transformation stories often, although they might not realise it

It was suggested that when Australians talk about 'reform' (e.g. tax reform, law reform, economic, social reform etc) or some sort of 'better' future they are contemplating the need for transformation, but they rarely think deeply about the nature of transformation.

It is important to distinguish deliberate (desired) from imposed (unplanned) transformations

Participants recognised that transformations might happen because we desire and seek them, or as unintended consequences of other actions. There could be clashes and tradeoffs between the two. For example, it was asked: 'if Australia continues to seek economic efficiency, how might that affect our identity as a nation?' Another group contemplated how technological and other transformations influencing the nature of leisure and work might affect gender roles in positive or negative ways.

We don't think broadly or deeply enough about the role of technology versus other factors

Technology is the factor most frequently linked with transformational change in the media and literature, but many workshop participants realised that, once they started thinking

about how Australia might change in fundamental ways, there are many other factors that might be transformational (as illustrated below). Furthermore, participants suggested that Australians do not think deeply enough about the role of technology in shaping the future. For example, they asked how often we use technology in a deliberate way to create better futures, and how often we allow the emergence of new technologies to push us in a piecemeal way towards futures that we have not really thought about and might not like when we see them.

Opinions differed about whether transformation can be deliberate

It was observed that many transformations in Australia's past have been largely unforeseen and unplanned. Some argued that the processes of change are inherently unpredictable and uncontrollable, while others suggested that it is possible for Australians to make at least some deliberate choices about transformation futures and work towards them.

Transformation is rarely gradual or obvious while it is happening

Participants saw transformation as a process that builds slowly to a point, after which change becomes rapid and if often irreversible. This process might be perceived differently by different people (some might see the slow change happening, while others might be surprised when rapid change becomes apparent).

Societal and personal transformations can be interlinked and nested

Participants thought that transformation can be about society as a whole (e.g. laws, norms, attitudes, institutions etc.), but also about individuals (e.g. emotional and bodily change). Societal and individual transformations were thought to interact with, and cause, one another. Similarly, transformations can be nested (e.g. multiple transformations at one scale of time or place might accumulate to make a larger-scale transformation or, perhaps, to negate one another so that there is no apparent change at the larger scale). One example suggested was that levels of education have increased for many but levels of literacy are still low for some sectors of society. Overall, it appears that Australia has remained a highly educated country. A similar example given was the uneven distribution of wealth in Australia, which is masked by the fact that the nation's overall wealth has grown.

What might a transformation future look and feel like?

Two very different possible societal transformations were envisaged: one individualistic and another community-focused

Participants imagined that, in the extremes, Australian society might develop towards a society that is highly individualistic, or one in which people are strongly connected and community-focused. A connected future might be like past Australian societies (a back-transformation) or in ways not seen before. Most participants considered an individualistic

future to be an extension of the current situation, but many considered a strongly community-focused future (respectful, nurturing, equitable) would represent a very different (i.e. transformed) Australia.

Respect for diverse ideas and cultural backgrounds was a commonly-envisaged desirable transformation in Australia's future

Comments about respect and diversity were very common among participants when considering what a transformed Australia might be like. Respect for diversity was taken to include racial, sexual, faith, political and other beliefs. Participants envisaged that, in such a future, Indigenous Australians would share fairly in economic and social life, moving freely and comfortably anywhere in Australian society, and, among Australians in general, there would be greater capacity for interpersonal interaction and an increased individual sense of self-worth. It was envisaged that access to social services, housing, food and the like would be affordable, and there would be a stronger culture of philanthropy than we see in Australia today.

The emergence of a 'new peasantry' was envisaged by some participants—a slowing of urbanisation and return to more decentralised settlements where communality is privileged and different skill sets are developed and valued at different scales from local ('village') to regional.

It was thought that Australia might also see greater diversity of housing forms and spaces within the built environment that encourage connections between people and satisfy different needs related to age, economic status, culture etc. It was suggested, for example, that the traditional one-family dwelling with garden might give way to sharing of parks, gardens and other spaces and apartment living (similar to trends in Europe).

But no transformed future is likely to be universally desirable or undesirable

Many conversations revealed ways in which transformations driven by the pursuit of desirable futures might unintentionally create undesirable side-effects.

One set of examples was around interrelationships between generations as Australia's population ages. It was thought that opportunities for older Australians to remain in the workforce might reduce the public costs of healthcare for that generation but might also increase the accumulation of wealth within that generation, robbing younger Australians of opportunities. It was envisaged that some older Australians might seek to reverse that wealth-accumulation trend by facilitating redistribution of wealth, but that such a transformation might be opposed by entrenched financial processes in Australia and globally. It was also suggested that growing wealth among older Australians, combined with a reduced supply of young labour, could give rise to an underclass of migrant labourers.

A technologically transformed Australia, it was suggested, might create a 'technological divide' between those willing and able to embrace new technologies and those who won't or can't. It was suggested that people might have little privacy in a technologically transformed future but still might feel isolated if they are not technologically connected.

Participants recognised several conundrums related to the emergence of a community-focused society. Pressure to limit resource use, for the common good, might lead to smaller families and this could encourage a focus on individual families and their few children's futures rather than the common good. One pathway to achieving a community-focused society might be excluding those who are perceived as a threat to that society, working against respect for diversity. A community focus might see the emergence of stronger religious and ethnic groupings that promote internal cohesion but possibly lead to societal tensions.

The future of gender roles is particularly important, but its trajectory is unclear

Gender roles were raised often in conversations about how Australia might transform socially in the future. However, there was disagreement not only about how gender roles might change in the future but also whether they have changed in the last 100 years or so. It was suggested that a trend towards respectful and community-focused futures should include respect between genders, and that this should lead to equality of opportunity. However, it was not clear whether this might lead to fundamental changes in the nature of gender roles or just corrections to current inequities.

Ageing is reversed, obesity is no longer a problem …

Participants imagined a technologically transformed future Australia in which many current health issues are no longer challenges and even ageing is slowed or possibly reversed. Some participants imagined a future where you could eat as much as you like without getting fat, but others pointed out that this could lead to a reliance on technology to manage health and wellbeing that could reduce our ability to anticipate and respond to unexpected health risks in the future.

Human evolution and identity might change under the influence of technology

Participants listed areas in which they could imagine massive application of new technologies in Australian society: food; energy; water creation; health; emissions from energy usage; urban transport systems; international travel (teleportation). Furthermore, they speculated that humans might be technologically enhanced in a range of ways, from external enhancements (e.g. Google Glass) to implanting of technology (e.g. nano-bots etc) within humans brains and/or reprogramming of those brains. Some asked: 'Might Australians become the world's smartest people?' Some suggested that: 'We could make the world's education system a transformed business'.

But, at a more fundamental level, it was considered that technological transformations have the potential to change the identity of human beings. For example, it was asked: '*Can* we guide the process of evolution (e.g. using medication, genetic technologies, selection of offspring, education etc.) and *should* we do it?' Some participants wondered whether the ways in which human societies work are able to produce a 'better' type of human than has emerged due to random mutations and natural selection. Furthermore, some asked how technological change might affect our social arrangements (e.g. clans/tribes versus communal groupings versus smaller family or other groupings versus something new)?

More opportunities to access, analyse and synthesise knowledge

A common vision of a transformed future Australia involved improved access to, and communication of, information. Participants imagined various ways in which this trend might play out in Australia by 2050, including: interfaces between governments, industry and society become more user-friendly; laws and other institutional arrangements encourage openness and transparency across society so that people know exactly what information they need to help them live the way they want to; Australian research is commercialised more often in Australia; formal and informal education offers broader learning opportunities for all and is aimed at increasing awareness and understanding of all aspects of life and empowering people to engage in processes determining society's future; basic literacy levels and technological abilities are achieved across society.

But a word of caution was offered: as dependence on technology increases, our resilience might be reduced and society might become fragile and prone to collapse if technology fails.

Decoupling of economic progress from consumption of resources was seen as a key desirable transformation

Many participants thought that a change in attitudes towards truly sustainable resource consumption would represent a transformation in Australian society. They envisaged a future in which consumers are more ethically aware, and producers in all industries have had to adjust their production techniques to reduce demand on non-renewable resources.

Dematerialisation of the economy (i.e. economic activity is not reliant on non-renewable resources) was imagined as a key feature of this future and examples were given of steps being undertaken towards this goal currently. New energy futures would include distributed storage, mini-grids, better technology, decreasing costs. Nutrients (sewage) would be recycled more effectively, and a range of environmental services (beauty, natural light, biodiversity, water, etc.) would become increasingly valued.

Some participants asked: 'Would we be able to sustain affluent lifestyles in a transformed 100%-renewable society?' The consensus was: probably not, but we would nevertheless be able to have high levels of wellbeing (i.e. wellbeing would be decoupled from affluence). It was envisaged that there would be an increase in user-pays services rather than a large tax

revenue base, and a greater requirement for those who can afford it to pay for public services. It was expected that there would be wider and more effective use of market-based mechanisms to make sure the environment and society are valued properly, and, in the extreme, large numbers of people might exit the traditional economy and go 'off-grid', moving away from the use of cash and traditional economic transactions.

A warning was expressed, however: 'If we value relationships over growth, we might feel we fall behind other economies'.

Australia's place in the world could change in several alternative ways

Participants envisaged that relationships between countries globally might become more collaborative and cooperative on the one hand or more competitive and isolationist on the other.

In a globally cooperative future, it was suggested, Australia might become more connected with south-east Asia, while still maintaining cooperative relationships with the USA and Europe. More Australians might speak Asian languages and Australia's culture would become more multicultural. In this future, Australia's influence might come from it being a link between east and west.

In a highly competitive and fragmented future, it was envisaged, Australia might have to choose whether it aligns with east or west. In such a world the USA might maintain or increase its global dominance or China might become the dominant global economic and cultural force. In a USA-dominated world, Australia might continue to be a close ally of the USA, and its culture might become increasingly Americanised. If China became dominant, Australia might have to either move closer to Asia, creating economic risks if Asian economies falter or do not feel they owe loyalty to Australia, or maintain economic and cultural links with the USA and Europe, creating the risk that Australia becomes isolated in this region. In these competitive futures, Australia's influence might depend on how some very difficult strategic decisions are made.

It was recognised by participants that these are extreme alternatives, that combinations are possible and that geopolitical power shifts not currently considered might arise. The geopolitical situation would likely influence many other aspects of life in Australia. For example, it was speculated that free movement of people in a cooperative future might blur national boundaries and that new allegiances might emerge based more on tribal affiliations, cultural heritage or community interests (e.g. alliances between agricultural communities across national boundaries and regions). It was asked what other impacts these geopolitical transformations might have on social relations within and between parts of the world.

Clearly exploration of this topic was far from complete when the groups rotated to new archetypes.

Australians cannot assume that our governance arrangements will remain untransformed over the next four decades

Several groups observed that many Australians see their country as very stable politically and institutionally, and cannot imagine major changes like those seen in other parts of the world. The comment was made, however, that Australia has seen transformations in governance in the past. The introduction of European-style government and institutions after the arrival of the First Fleet, and the Eureka Stockade uprising in the Victorian gold fields, are two obvious examples, but participants asked whether there were transformational changes in governance related to major changes in Liberal versus Labor governments, World Wars I and II, changes in the fortunes of agricultural industries, mining etc. It was also observed that cultural transformations are constantly occurring through second or third generation migrants and that education and multiculturalism have been historical drivers of change in Australia.

The big question identified by participants was whether Australia can recognise when a transformation in governance might be needed and take pre-emptive action to guide a relatively smooth transition. It was suggested by some that Australia needs creative destruction—massive change without losing the established social and other capital in institutions, systems, technologies, knowledge, trade capabilities etc. that would be valuable to the success of a transformed nation.

Both evolutionary and revolutionary changes in governance and government are possible

It was suggested by several groups that Australia might be in the process of a transformational change in governance from the current high reliance on central governments to a greater engagement with people across society, and their relevant skills, experience and motivations, in identifying and dealing with complex social, economic and environmental challenges facing the nation (the terms 'polycentric governance', 'adaptive governance', 'devolved governance' and 'subsidiarity' were heard frequently). A greater role was envisaged for regional governments, which would add a strong local-scale dimension to tackling major social and environmental challenges.

Alternatively, centralised governance might re-emerge as the dominant approach in the future.

Ideas about major plausible changes in government in Australia included: Australia and New Zealand becoming one nation state; direct democracy, in which sampling of populations via smart tech is used to gauge values and inform laws and pathways (but this could be quite unstable); the Greens becoming a majority party, controlling government and leading to restoration of biodiversity; politics being transformed by the advent of an

accountability court in which future generations can bring poor leadership to account; regression to authoritarianism.

A key question was how Australia might cope in a political sense with a very rapid rate of change. Participants thought that it is possible to see both evolutionary changes to governance and government (gradual modification of existing institutions and approaches) and revolutionary changes (e.g. temporary suspension of democracy to deal with major crises) in the next few decades. It was asked whether Australia becoming a republic would qualify as a transformational change and, if it did, whether it should be seen as evolutionary or revolutionary.

By which possible pathways might transformation futures come about?

A range of actions was suggested, which might enhance Australia's ability to deliberately transform if necessary

It was concluded by several groups of participants that it will be very difficult to transform Australia deliberately in desirable ways unless Australians can be clear about what they want to achieve for their society. It was also noted that there is very little current dialogue about Australians' visions for the future of the nation, or even how we might measure important aspects of a good life, such as wellbeing, safety and security, in 2050.

It was suggested that there are three key requirements to allow well-informed deliberate transformations to occur: (1) recognition that some sort of transformation is needed; (2) ideas about the nature of that transformation and how it is expected to overcome perceived problems; and (3) social acceptance by individuals and communities that the transformation will meet their hopes and needs.

Workshop participants considered the sorts of actions that, if taken, would be expected to enhance Australia's ability to address these three requirements. In summary, the key actions included: recognising and respecting the diverse beliefs, hopes and aspirations of Australians and engaging in dialogue to identify common visions for Australia's future; providing and communicating information that enables citizens to understand how nature and society interact and what is unique about these interactions in Australia (e.g. understanding of limits to resource use, how ecological systems provide economic and other benefits to people, and the implications of factors such as poor soils, drought and fire for Australia's long-term future); encouraging Australians to be more aware of, and reflective about, the present social and ecological environments they live in; encouraging the learning of lessons, from past trends and events, about how Australia might cope with future social, economic and ecological challenges and opportunities; creating opportunities for all Australians to experience first-hand the implications of different approaches to managing natural resources; creating opportunities for all Australians to contribute to constructive

dialogue about Australia's future; thinking as a society about how traditional and social media might contribute more helpfully to the above actions; challenging the view that we are 'The Lucky Country' (i.e., our luck will hold out without us making too much effort); encouraging our individual and collective imagination about how Australia might be in the future.

We cannot predict or control transformations, but we can be watching for the signs that they might be occurring

Several groups of workshop participants reflected on the seemingly unpredictable and uncontrollable ways in which transformations come about (e.g. complex interactions between trends, events and actions by key people at particular times and places that create leverage and momentum for change). They noted that attempting to generate transformations, on the one hand, or waiting for transformations to happen by chance, on the other, are both fraught with the risk of unintended or unexpected consequences.

But several participant groups noted that applying an understanding of how social and ecological systems function can raise our awareness of possible transformational changes that might be underway.

Considering the possibly far-reaching implications of events and actions—rather than just focusing on immediate effects—can help us anticipate their influence (or leverage). Events or actions that change the rules of how social or ecological systems work (e.g. laws, regulations, incentives, opinions and policies that change behaviours and attitudes) can have high leverage. One example mentioned was the structuring of built environments, which can encourage or discourage meetings and conversations among people.

The influence/leverage produced by ideas, events or actions is often determined by how 'catchy' they are and whether people, governments and other institutions are receptive and able to act at a particular time or place. The concept of 'tipping points' was raised in this regard, and there were conversations about how societies might be more susceptible/receptive to transformation when processes are stagnated, grid-locked, ineffective, corrupted etc. It was observed that such susceptibility can build slowly and only become apparent once a shock is experienced, such as an earthquake in Haiti, bushfires in Australia, or any of a number of possible ecological, political, social, economic and other shocks that Australia has seen or might see. It was also observed that understanding leverage can be used not only to maximise the effect of decisions supported by the majority, but also be used to give undue influence to vested interests.

Participants noted that transformations might not happen in one go, so it is important to be alert to the possibility that multiple influential events and/or decisions might compound until major change occurs

Processes for encouraging or resisting change (positive or negative feedbacks) are key drivers or dampeners of transformations

Following from the above, several participants stressed the importance of processes that reinforce desired trends and actions and/or feedbacks of information that reassure people they are heading in the direction they want to be heading. In this regard, incentives and reward systems were seen as key drivers of future transformations of Australia.

Participants discussed various forms of positive feedbacks that might be important in Australia's future to 2050.

Financial rewards for desired social and/or environmental behaviour (e.g. via taxation incentives) were mentioned frequently, and it was stressed how important it is to recognise and value the many bottom-up community-focused initiatives that have been emerging for some time but often are not well known throughout society.

It was also emphasised that society will be in a better position to support or reject transformations if information on the social and economic costs and benefits is gathered and shared (e.g. how might moving towards sustainable natural resource management affect food quality and quantity and mental and physical health?). The broader concept of societal learning through trying new approaches and assessing their merits was mentioned and different specific approaches were mentioned. In this regard, encouragement of 'first movers' and 'first followers' was seen as an important way to explore new possibilities, as was financial and cultural encouragement of innovation (which might involve exploring new ways to support speculative ventures and tolerating higher levels of failure in investment on behalf of the nation's future). For example, one group asked what Australia might learn from initiatives like micro-banking in developing countries and, more generally, how Australia might strengthen a culture of innovation and self-reliance and discourage a 'handout mentality'.

The roles of key individuals in reinforcing desirable behaviours or discouraging undesirable ones was mentioned.

It was noted that removal of disincentives could be as important as the creation of incentives. For example, if barriers to communities initiating common-good projects were reduced then these might become more widespread. It was observed that the achievement of universal voting rights and the advent of the contraceptive pill are examples of constraint-removal that led to major change. A related, often-mentioned, constraint was gender inequity. Considerable conversation was had about how Australia might transform if a critical mass of women in positions of power was achieved during the next few decades. Ways in which it was thought this transition might affect Australian society included greater investment in families and communities and a shift in work-life-balance and consequent

levels of mental and physical health. It was observed that there has already been a transformation towards smaller family sizes in Australia as women's roles have changed.

Shocks are the most likely drivers of transformations—how we respond will make the difference between deliberate and imposed transformations

Some participants suggested that 'transformation might be seen as "the fruits of crisis"'. They pointed out that the opportunity for transformations often is created by some form of disruption that both provides the impetus to make changes and frees up resources that can be used to make those changes. It follows that a transformation—at least a deliberate one—requires appropriate actions while the opportunity for transformation exists.

There were conversations about what size and type of disruption might be required to transform aspects of Australia. For example, it was thought by some that the 2008 Global Financial Crisis had not been a big enough shock to trigger a transformational outcome for Australian financial systems.

It was noted that shocks have uneven effects across different parts of society and different spatial scales. For example, it was suggested that while individuals and local communities that directly experience natural disasters, like bushfires, floods, and hurricanes, undergo personal and societal transformations, often the higher scale (e.g. regional, national) institutions, which might have contributed to the crisis, resist transformation (the example was given of Hurricane Katrina in the USA).

It was noted that, even when faced with crises, many members of society find fundamental change frightening as it probably means 'no-going back'.

Some participants pointed out that shocks don't have to be disasters: The contraceptive pill was transformative as it changed the roles of women in society. The Internet and smart phones have been transformations. The Eiffel Tower, the London Eye, the Empire State Building and other iconic landmarks had transformational influence on people.

Transformations might also be driven by the need to head off future catastrophes, if those catastrophes can be anticipated and there is the will to act in a timely fashion.

Transformations in Australia's governance and government could be drivers of further transformations

When asked to consider what a transformed Australia might look like in 2050, several groups of workshop participants considered the possibility of decentralised, polycentric, governance arrangements (see above). It was suggested that this transformation in governance arrangements might go hand in hand with new approaches to society-wide dialogue about the future, which would in turn generate new ideas and transformations in social processes and approaches to managing natural resources. It was suggested that, in this way, we might see Australia reach the point where its people can, as a nation, plan for

change. It was asked how voters might get to the point where they allow their leaders to admit they are uncertain about the future and give them permission to try new ideas and sometimes fail. Such an approach to navigating the future was suggested to be transformational itself.

At the other extreme, it was concluded that Australians might surrender some aspects of democracy to allow governments to deal with major crises (i.e. in a similar way to which governments are often given greater powers in times of war). Authoritarian government was suggested as a possible—if undesirable—driver of a range of social, economic, technological and other transformations.

Cheap, renewable energy could be a catalyst for various social and economic changes

A few participants considered the consequences of a transition to new forms of renewable energy. They concluded that this change would be likely to precipitate major social and economic changes that are difficult to imagine now and could represent transformations.

Information can be a stimulus to transformation or a brake

It was noted by participants that information and communication technologies can generate new ideas and create new and transformative connections between people, but that people can also become overloaded by too much undigested information. Furthermore, it was suggested, instant access to information is likely to see the rapid spread of unmoderated, and often biased, extreme or poorly considered information and opinions. It was thought that such processes can create artificial consensus by bringing people with like views together and giving them a false sense that their ideas are widely supported. In the absence of good information and communication, fear can be used to influence people's emotions, exert control over society's processes and actions, and/or create confusion. In this way, fear can be used by minorities with vested interests to block change that might benefit the majority. In the view of some workshop participants, the use of fear and information-confusion is already emerging in many parts of the world, and whether it grows or gives way to better forms of information sharing is a major uncertainty that could shape the next few decades in Australia and globally.

Leadership is a vital requirement for transformation and its sources might be changing

It was noted that transformation usually requires leadership, and many participants questioned where such leadership might come from in the future. One group questioned whether poor leadership is the norm and that Australia has been rescued at times by 'unexplained rashes of good government'.

Some participants suggested that current politicians are focusing more on reading and reacting to public opinion than shaping it and that if this trend continues it will reduce the chances of deliberate and timely transformations. It was asked by many participants whether Australia might move away from expecting leadership from politicians and look towards thought leaders and cultural role models across society, as has happened in other countries such as the USA and several European countries.

Australia's potential to transform might be limited by constitutional and infrastructural inflexibility

Two forms of inflexibility were identified in the conversations about transformation futures. It was suggested by some that Australia has a very stable political system, partly due to an inflexible constitution, and that modifying the constitution could allow transformation (presumably desirable or undesirable) to occur more easily and quickly.

Another observation was that countries with high levels of established infrastructure have been found over the past few decades to be slower to adapt to change than countries that have not become as developed in this sense. For example, it was suggested that Australia's investment in infrastructure around agriculture limits its ability to adapt and, if necessary transform, to cope with changing climate and global markets.

Summary

Workshop participants reported that this archetype challenged them to think about what they value in the present Australia, what they would hate to lose, what they would like to gain in the future, and what factors might drive desirable or undesirable transformations (fundamental changes) in Australia in the future.

Although most participants focused on desired and beneficial transformations (encouraged by the workshop organisers, because negative transformations were addressed in other archetypes), undesirable transformations occasionally came to the surface.

Desired transformations tended to be about a fairer and more cooperative society, but, in common with the conversations about restraint scenarios, there was a sense that such transformations will require numerous changes to attitudes and social processes (especially governance structures and the nature of politics and leadership) that currently seem unlikely. It was also recognised that there is a need for conversations about what 'desired future' means to Australians. It was clear that there is no one vision that we all share, but there are probably core elements that are part of most visions.

Perhaps the most challenging aspect of the conversations in this archetype was that so many aspects of a desired future were seen as requiring fundamental change from present Australia.

Commonalities and differences

Purpose of this session

On the final afternoon participants took part in discussions on commonalities and differences they had noticed in their conversations. They referred to commonalities and differences between participants, and also between archetypes, and both are summarised here. Some participants pointed out that separating the archetypes reduced the opportunities to discuss the interconnections and relationships between archetypes, so this session was an opportunity to discuss these aspects more. Note that this is a summary of what participants said in this particular session about commonalities and differences. More commonalities and differences become apparent when reading material from the archetype conversations sessions.

Comments summarised

Conversations were shallower than participants would have liked, and differences were not explored in depth

Participants spoke of the conversations being rewarding, but they also said that in their efforts to be polite, and to follow the request to hear all views, they often avoided delving into differences of opinion. There were suggestions that exploring these differences would have brought out more passion and creativity in the conversations, and participants wondered what was missed because people were 'ducking differences of opinion'. Any mismatch in depth of knowledge and understanding on an issue also created a barrier to exploring differences further. Where participants felt well matched in knowledge and understanding with others they spoke of conversations with rich details, strong engagement and novel twists that helped them see things in new ways.

Some appreciated the structure of the conversations and others did not. Some prefer unstructured conversations that free people to 'dive in' rather than 'get caught up on the set-up for the conversation'. There was also the suggestion that delving deeper can reveal more frailty and fragility, perhaps suggesting that shallow conversations are 'safer'.

More commonalities than differences between people, and participants readily considered others' perspectives

Comments on differences encountered were primarily about whether people were positive or negative, optimistic or pessimistic, and which archetypes they found easiest to talk about. Participants perceived more commonalities than differences between them, including a common view that change is needed to bring about desirable futures.

Participants spoke of active attempts to see things from other points of view so they could pick up different perspectives and ways of thinking about the world. In doing so, some spoke of seeing more options and pathways for our future than they had originally thought of, and on having their minds changed on some points. There were also comments about how it became clear how the issues being explored are 'all relative and contextual', and that in some conversations there was more effort spent on reframing of the issues rather than on the content itself.

Archetypes are not independent

Participants identified common aspects that emerged in discussions in all archetypes. These included: technology, social values, market and economic forces, China, pandemic, population growth, ageing, decision points, resource constraints, environment, environmental and social limits, governance and leadership. Some topics people expected to be hearing in each archetype were less pronounced or absent in some archetypes (e.g. discussions on gender).

The interconnections and relationships between archetypes received particular attention. Participants said that no future will be a 'pure realisation' of any one of these archetypes, and instead futures will include aspects of all the archetypes, perhaps meandering between being more like one archetype and then another. Crossing scales from the fine detail to the big picture was also difficult, especially where patchiness is likely (e.g. some segments of society experiencing collapse while others experience growth).

These overlaps were confusing to some, with comments that 'all of the scenarios started to converge' and 'everything was starting to become a mush' towards the end. There were several comments involving pathways in which one archetype can trigger another, or can follow in sequence from one another. For example, Catastrophe was seen as a likely pathway to Transformation, and Growth was seen as a likely pathway to Catastrophe. Growth and Restraint were seen to occur together, with restraint in some areas allowing growth in others and vice versa. Recognising that all futures involve change, a particular challenge for the Transformation sessions was to consider at what point is change considered transformation?

Human values, choices and behaviour shape our future more than events or processes outside humanity's control

All the futures were seen as an outcome of societal processes, with human choices and behaviour shaping our futures more than events or processes outside humanity's control. Furthermore, participants expressed the view that change is inevitable, needed and desirable (e.g. 'keeping the status quo would be negative', 'change is required to maintain the current quality of life'). Participants struggled to identify desirable growth futures, but nor were they suggesting 'no change' is likely or desirable. One response was to say that having thought about multiple pathways and futures, they 'can now see a bigger role for us than a vote on election day'.

Key influences on human choices and behaviours mentioned by participants included: public policy, government and governing institutions; markets and other economic structures, perhaps enabled or enhanced by technology; and social/cultural values, norms and beliefs, perhaps influenced by technology. The priority given to knowledge, learning and education in society was mentioned as a particularly important influence. Some identified public policy as leading and shaping changes in values, beliefs and norms, and others emphasised the reverse influence. Taken together, feedback loops between governance, social values and norms were implicit in the conversations, e.g. a reference to 'push/pull' interactions between public policy and social change. Technology was identified as playing an important role across all, especially when technology increases the ease and convenience of change.

Generational changes were identified as important influences, and these included: tensions between generations; transfers of wealth and opportunities between generations; and the possibility that younger generations may be more open to novel mechanisms for sharing and restraint than older generations.

Participants were divided on whether future changes will produce more or less diversity across society. There were suggestions that globalisation, immigration, urbanisation and greater connectivity will lead to a more homogenous society, and other saw these same mechanisms as allowing more diversity, especially as micro-levels of interest can be better catered for in a globally connected world. Individualised media, advertising and news can serve to reinforce pre-existing view and prejudices leading to less cross-cultural or political exchanges. Alternatively, greater awareness and mobility can bring greater respect for diverse cultures.

Participants identified current trends that may indicate what lies ahead. These included:

- movement away from generic products, to more small-scale, creative and unique production in response to local needs, preferences and context
- growing number of ways of sharing and working collaboratively, and more design focus to favour such interactions

- growth in psychological issues
- changes in the nature of volunteering and philanthropy to allow short bursts of sporadic participation rather than requiring long-term commitment to a cause
- actions align with what is convenient.

Social cohesion was identified as a key factor in shaping our resilience and our options in response to future events, including whether future events trigger transformative or catastrophic changes. Pathways for building social cohesion were uncertain, apart from learning from resilient natural ecosystems and other nations with high social cohesion.

Participants considered the kinds of futures that will occur under different sets of values. There were references to principles of justice, tolerance, multiculturalism, trust, material aspirations, openness to 'non-growth' options, consumer convenience, notions of what is 'normal', and views on 'luck' versus hard work. Participants also wondered how values change over time and the impact of changing values.

The way we interpret, measure or frame the world around us shapes what is possible and what happens

Participants spoke of how different interpretation of terms such as 'growth', and the choice in how we define or measure key concepts or indicators, can have a large impact on how the scenarios are imagined. Quality of life was a concept that received particular mention.

Media, social values, cultural norms and institutions were identified as being important aspects shaping our default views and interpretations, and can lead to an overly narrow view. Participants also suggested that in our society, framing an event as a natural calamity is less confronting than naming it as a human-caused and potentially preventable event. Participants also stressed that we are framing these issues from a position of privilege, and it gives us a limited view of the world. Particular sectors, such as corporate or media sectors, were seen to be inclined to frame issues in a particular way and not be open to alternative ways of seeing issues.

A preference for positive, optimistic, agreed futures, even though they weren't a required outcome of the event

There were many comments about whether aspects of scenarios were described in 'positive' or 'negative' ways. In general there was a strong tendency to seek 'positive' versions of the scenarios (except catastrophe, where participants were asked not to seek to 'solve' the catastrophe), and some spoke of the troubles in doing so for Growth futures. The absence of discussions imagining and accepting desirable Growth futures was identified as an important, missing element from the discussions.

Many found it difficult to imagine positive growth scenarios, and that proved to be a challenge for some. Judging from the comments, participants expressed more satisfaction

when they could find positive futures they could agree on with others, than when exploring negative options or futures that brought out disagreements between participants. By positive futures, participants were generally referring to social equity, environmental sustainability and long-term human wellbeing. (Note here that the event organisers were not looking for positive, agreed visions of the future as an outcome of the meeting, but rather an exploration of different possible futures).

Governance: top-down or bottom-up, coercion or consent, serving individual short-term interests or long-term common good?

Governance processes, whether formal or informal, featured prominently in all scenarios. Leadership and public policy received a lot of attention, being identified as key influences and drivers of human values and behaviour (and vice versa as described above). There were many discussions on appropriate or preferred governance mechanisms for fostering coordinated actions, and these mainly revolved around questions of top-down authoritarian versus bottom-up citizen-driven structures, or mechanisms for coercion versus consent.

The development of alternative governance mechanisms for ownership, property rights or access to materials and services—and particularly shared or collective ownership or access—was a strong theme. Once these are in place and convenient then it makes cooperative behaviour far more likely and common. Whether these changes in governance are part of (or enable) incremental or transformational change was an open question.

Participants raised issues in politics and government, including: lack of trust in government; challenges of working with highly divergent views on governance approaches; lack of shared political vision guiding policy and legislation; doubts about whether our current democracy allows adequate long-term planning; and open questions about whether Australia will see leadership taking proactive responsibility to define and shape our future.

Planning is lacking, and crises are common pathways

Some participants said that pathways to different futures were harder to describe than characteristics of those futures, while others said that pathways were of more interest than any particular future destination. One comment described pathways as falling into three categories: imposed, chosen or 'transformative but covert'. While participants saw pathways with gradual or sudden change in all archetypes, 'crisis' was mentioned as the most common pathway across all archetypes. Participants said that crises force us to change, they open up new possibilities, they test our resilience to shocks, they bring out our capacity to adapt and determine how we will change. Participants noted that many big changes have not required a crisis, and another important aspect when considering pathways is to think about conditions that allow change.

There was a suggestion that Australians are not being pro-active about defining their own future, and without that pro-active leadership it will take a crisis to bring about change.

Participants spoke of inadequate long-term planning, particularly in the public sector. Current practices appear to be locked in, particularly by existing investment and infrastructure decisions. Investment cycles were mentioned as particularly important, and one comment was 'the kinds of investments necessary for transformation aren't happening'. Participants said that long-term risks are not handled well.

Reflections on process

Purpose of this session

On the final afternoon participants had the opportunity to reflect on the process used at this event. These reflections are important, as one of the broader aims of the event was to learn better ways to have a 'national conversation' about our future. Again, comments were captured in iMEET! and are summarised here.

Comments summarised

Enjoyable exploration of possible futures

Many saw value in the process, 'articulating new ideas and perspectives on the future, about the way our country works, and the possibility for interaction between ideas'. Not requiring agreement or decisions freed people to 'lob in ideas', and some 'enjoyed the absence of a strict deliverables for participants'. Other comments included, 'Most participants would do again or recommend for colleagues in the next iteration' and the 'standard of conversation and insight have been quite high'.

Expectations and preparatory material could have been clearer

Participants said that they didn't know the event was going to be like this, and made suggestions on how they could have been better informed and prepared. Some said it wasn't clear whether they needed to read all the material provided beforehand, and some thought that they would be given more detailed information about the archetypes before taking part in conversations about them. Some would have liked more detailed descriptions, or more creative or stimulating ways of 'priming' people for the conversations. Suggestions included requests for more detailed information (e.g. specify a particular catastrophe), more creative stimulation (e.g. poetry), and no imagery (as it 'can overly shape things'). Participants recognised that the choice of words and images influences the results, and had a different approach been chosen the results could have been very different.

Uncertainty about purpose and outcomes

There was some confusion about purpose: 'An interesting process, but still struggling to understand the purpose. What was the purpose of this for anyone? Confused.' There was more confusion about the outcomes, and what will come from the event. There was a lot of

discomfort with the open-ended nature of the event, with responses like 'what is the closure?', 'what happens next?', 'feels open-ended', 'the process is not conclusive for participants', 'we'll just scatter afterwards', 'lack of decision points has frustrated and confused', 'we haven't got outcomes about where to go as a preferred future', 'nothing at stake' and 'no one has authority to make decisions'. When considering the material generated over the event, participants pointed to its preliminary nature and lack of any synthesis: 'the content seems to be a list, not a synthesis'.

We're not a representative sample

Participants commented, 'We're not a representative sample', referring to a range of dimensions including politics, expertise, sector of work, age, cultural background, gender and socio-economic indicators. Participants noted the views among participants appeared to be quite similar, and not 'typical of mainstream' (e.g. 'participants seems to be skewed towards those with a "limits" mindset') and wondered whether the selection criteria for participation could have included a wider range of backgrounds and experience. Participants wanted to see more diversity saying, 'the mix affects the conversation'. Some participants attended the Phase 1 event in Bowral, and commented that 'the sample is much wider than the original Bowral conference'. Participants readily acknowledged 'you can't engineer it so it's representative', it's 'easy to criticise' and it's 'hard to get the right mix'. Furthermore 'people interested enough to come are a skewed sample'.

Low emphasis on participants' backgrounds and expertise

Participants would have like to have known more about each other's backgrounds and experience, and wondered why the biographies were not circulated. Some suggested that more knowledge of who they were talking to would have made for richer conversations. Others said that they thought the conversations were richer because they 'weren't worried about backgrounds'. There were comments too that 'we connected with one another pretty easily' and 'building rapport helped build conversations'. Other comments here included, 'starting on more of an even footing in terms of not knowing people's backgrounds has actually been conducive to good conversation' and 'younger participants especially have found it less intimidating'.

A perception that expertise was suppressed

Some participants had the impression that they 'had to leave expertise at the door', even though this had not been requested of them. One comment was that 'participants' expertise has been suppressed since we are here to do the exercise rather than convince people of expert views'. Regrets accompanied comments that 'expertise had been suppressed', saying that there was a lost opportunity to benefit more from the expertise in the room. Another comment was to hope that expertise was there 'in the implicit thinking or beyond' and that conversations were 'across all aspects of the self, professional and personal'.

Conversations showed consideration and restraint

Participants referred to 'a level of restraint in conversation', with the suggestion that people were being particularly considerate to others. Words such as 'civil', 'constructive', 'safe', 'diplomatic', 'polite' and 'self-censoring' were used in some of the descriptions of the conversations. The conversations were seen as non-judgmental, 'acknowledging others' perspectives, but not offering judgments'. Other comments were, 'Noticed some profound differences handled clearly and positive things came from that', 'It meant people felt safe to say what they thought', and, 'Bringing people's attention to the idea of good conversation was a very useful point.'

Differences and disagreements were noted, but not fully explored

Participants observed that differences were handled in a way that diffused any potential conflict: 'This was about noting, not arguing', 'not being in a group for very long, and being set up to listen, could have both contributed to us not seeming to disagree so much'. While they welcomed the absence of conflict, they would have liked more opportunity to 'get past niceties to passion and pull in differences in background/experience/training/expertise'. Participants would have liked deeper conversation and exploration, 'really engage and chew it over', 'get into depth rather than skate on the surface'. One comment was 'Scientists were not happy with the rigour in the conversation'. Exploring disagreements further was a commonly expressed requirement for a more engaging conversation, pointing to the benefits of some 'break down in order to have a break through'. Some also suggested that a high level of abstraction in the conversations led to little or no disagreement, and more concrete conversation topics or requirements (e.g. a requirement to reach some consensus or decision) would have helped: 'We weren't forced to closure, so why would you push disagreement?' The conversations were seen as an 'opinion gathering exercise', which did not provoke debate.

Good conversations were civil, constructive, imaginative, allowed topics to build and contributed to a cumulative outcome

Participants commented that the area of foresight and futures thinking was new to many of them. In preparing participants for the exercise, one response was, 'Bringing people's attention to the idea of good conversation was a very useful point. It helped to keep things civil and constructive.' Rewarding aspects mentioned included: the opportunity to interact with people participants wouldn't normally interact with; conversations allowed for topics to build; the chance to be imaginative and 'expand on tangents'; 'the process is cumulative, not a set of separate conversations'; some conversations got into the 'nitty-gritty detail'; and noting a tendency to 'move away from thinking about what it means for me, to thinking more strategically, not focused on own preferences and interests'. For some, the quality of the conversation also depended on the archetype, with archetypes bringing out more imagination and creativity than others. Particular comment was made about the dinner table

conversation: productive, exploratory, the most interesting conversation of the event, and not captured.

Capturing the conversation was difficult, and changed the dynamic

Many commented on the requirement to capture conversation points in the iMEET! on laptop computers. In general, participants did not find it easy to record the content of their conversations, scribing was not enjoyable, when the screen wasn't visible the non-scribes couldn't be sure of what was being typed (unlike butchers paper), it served to 'hide disagreement a little', and there were concerns over the accuracy or superficial nature of the recorded points. One suggestion was for everyone to have their own iMEET! terminal. In short, 'Scribing changed the dynamic', it 'interferes with the flow of conversation' and was generally considered intrusive. Some carried a larger scribing task than others (e.g. young fast typists). Many said they would have liked to have had a scribe and facilitator at each table. In its favour, participants spoke of it supporting listening and respectful conversation, and that it was 'nice to get away from the traditional butcher's paper approach'.

Many would have preferred longer conversations and slightly larger groups

There were many comments on the length of time allocated to activities, with some commenting that the 15 minute conversations in groups of three were too short and 'valuable time was wasted in recalibrating' between the 15-minute rotations. Others commented that 15 minute sessions were okay, and that 'sometimes you want to stay longer, sometimes wanted to move on'. There were also comments that some participants would have liked slightly larger groups (e.g. 4-5 people). There were no objections to each archetype having one hour, and the opinions expressed were about how best to use that hour. Some found it hard to find time to do other activities, such as write on post-it notes, draw on the picture boards or post comments on Twitter.

Many trade-offs, but 'most things worked well'

Participants acknowledged many trade-offs in their comments: 'tweak something and you're giving up something else'. Some thought the conversation process was too structured, whereas others felt that structure and guidance were lacking. Some were happy with iMEET!, others didn't like it. Some thought conversations were too short, and others found the length about right. Some wanted larger groups, but some noted that quiet introspective people speak more in smaller groups. Some preferred butchers paper, while others were pleased not to have any. Participants saw that the group could have been more representative of the wider population, but also acknowledged it was much wider than the preceding event in Bowral. Some wanted more tangible outcomes and a requirement for agreement, whereas others 'enjoyed having the space to have a conversation without pressure for a final agreement'. One observation was that having a camera crew asking participants to reflect on the process helped participants see that features disliked by some

worked really well for others. Comments included, 'Most things worked well' and it was 'better than the usual format at conferences'. In particular, participants liked that conversations, not presentations, were the focus.

Suggestions for easing into richer discussions

Although participants appreciated the focus on conversation instead of formal presentations, there were many comments requesting more facilitation, direction and structure at an event like this. The openness brought out uncertainty, and for some that felt slow and harder to be creative. Responses included, 'it was very challenging because of the lack of structure, direction, which we were forced to find ourselves in the process', 'more facilitation could have helped', 'need more traction', 'make the scenario more tangible via smell/touch/taste', 'can we do more to move us into 2050', provide a 'pithy but stimulating start to each topic rather than go in cold' and facilitate a 'shift in conversation from abstract to concrete'. Other suggestions were to start with a summary video, debate on a 'hot topic' or a role playing activity, and there was a suggestion that a narrower, more specific focus would have been easier. Another suggestion was to structure the event to have short conversations at first, building into longer, more detailed discussions later in the piece as people become more familiar with the topic and each other. There were suggestions that each small conversation grouping be pre-allocated to save time and to ensure better mixing among participants. There were regrets that participants didn't get to interact with all other participants, and that conversations weren't deep enough to explore underlying assumptions and world views as much as people would have liked. Nevertheless, participants found 'scenario exercises useful for surfacing assumptions about the present'.

Interactions and comparisons across archetypes and historical events

Participants commented that when considering the future, they found themselves reflecting more on recent and historical events, searching for causes that could inform what we can do to prepare for the future. There were also comments on the connections between archetypes, and that their conversations included exploring the interplay between growth and restraint, and the ways that one scenario can trigger another (e.g. catastrophe can trigger transformation). There were comments also that the conversations in earlier archetype sessions influenced what happened in subsequent sessions (e.g. if catastrophe was the first session then aspects of catastrophe came into all subsequent conversations).

Prospects for next steps and possible partnerships

There were queries about what will happen to the material generated at the event: 'wondering how meaning will emerge from short sharp descriptions', 'feels like a twitter sphere of notes', 'what bubbles to the top', 'where are the common threads?', how to 'turn this into something that moves beyond generating ideas' and 'what happens next'.

Participants spoke of possibilities, big questions (e.g. 'how do we built a robust capacity to deal with an uncertain future through social systems'), preferences, priorities for society and decisions (e.g. via deliberative decision making) as outcomes they'd be looking to communicate more broadly. Mentions of potential audiences or partners in next steps included the research & development sector, science policy makers, local government, industry, arts festivals, schools, kitchen cabinets, online platforms, Country Women's Association, rural fire services, Rotary, teenagers, ABC and corporate sponsors. One comment was, 'This workshop has been good at demonstrating how these techniques could be useful', and there was the suggestion that the Academy can create a module for adoption by a wide range of groups and organisations in the community, or perhaps a 'sellable product on improving conversation skills and meeting people, where the content is about exploring a common future'. Another suggestion was to work with the NeCTAR consortium (https://www.nectar.org.au/about-nectar) to create a virtual lab in which people across Australia can collaborate via online forums or interactive computer models and games.

When considering the role of science, there was some wariness about allowing science a 'privileged role for filtering out plausible scenarios': 'Scientists have to step back in terms of prescriptions if we are to achieve a high level of buy in from communities'. Comments indicated that it would be helpful to have ongoing Academy involvement to provide a science-informed perspective, including aspects to consider when assessing plausibility. In particular, there was a suggestion that a deeper analysis of the growth and restraint scenarios would be an opportunity to map out major risks, uncertainties and opportunities. Another comment emphasised that science doesn't need to be the entry point for the conversation, and that all fields of knowledge and experience should be involved.

There were some suggestions for more effective communication. These included paying attention to language and keeping it simple, be prepared to 'surrender precision to get buy-in', provide information from science and other knowledge bases to better inform conversations and run the activity as a more formal consensus building endeavour.

Request to reflect triggered mixed responses

Some expressed a preference to spend less time being asked to reflect and more time on other activities, such as meeting more of the other participants and learning more about their background and experience, rather than reflecting on the event: 'Sometimes we're in a mood to reflect, sometimes we're not :-)'. Others commented that reflection activities were helpful, and in particular liked having the film crew interrupt with requests to reflect on what participants were doing: 'Early interruptions to reflect helped participants move forward. The organisers observed that features some people hated, others found worked for them really well and wouldn't change (horses for courses). 'There is room for interruption

for reflection in the moment to get value.' There was also a suggestion that providing a means for more personal anonymous contributions would be helpful.

Some found the process exhausting

There were comments that people felt mentally exhausted. They said it was a big challenge to be actively involved in so many conversations, and there was a desire to replenish, reflect and rebuild among more introverted participants. 'Is isn't a bad thing, but a new thing (and exhausting mentally).'